

# Physical Education

Answers and commentaries  
**A-level (7582)**

## **7582-1**

Marked answers from students for questions from Paper 1.  
Supporting commentary is provided to help you understand how  
marks are awarded and how students can improve performance.

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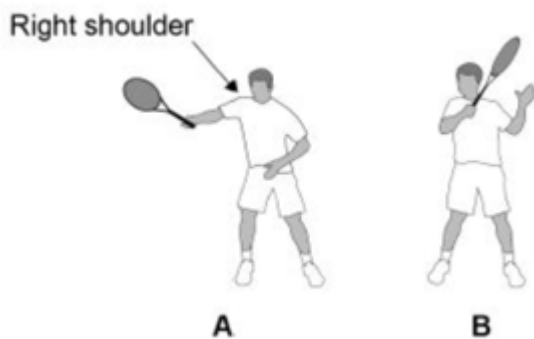
## Answers and commentaries

Please note that these responses have been reproduced exactly as they were written by the student.

### Applied anatomy and physiology – Short answer questions

#### Question 04.1 (2018)

The diagram below shows a tennis player performing a forehand stroke.



Identify the main agonist, and plane and axis of movement at the right shoulder as the tennis player in Figure 1 moves from position A to position B.

**[3 marks]**

#### Mark scheme

**AO2 = 3**

Award one mark for each of the following points.

- Agonist: Pectorals / anterior deltoid.
- Plane: Transverse plane.
- Axis: Longitudinal axis.

## Student responses

## Response A

Agonist: Frontal deltoid

Plane: ~~adduction~~ Transverse ~~adduction~~

Axis: Sagittal

Response A is awarded one mark for correctly identifying the transverse plane. The mark is awarded as this is the first word in their answer. Had it been the other way around it would not have been credited. 'Frontal deltoid' is incorrect as students must use anatomically correct terminology. Anterior is underlined in the mark scheme indicating it is essential for the mark when naming the anterior deltoid.

**1 mark**

## Response B

Agonist: Pectorals Deltoid

Plane: Transverse

Axis: Longitudinal

Again, Response B fails to achieve a mark for the agonist as 'Deltoid' on its own is too vague. Marks are awarded for the second and third points where there is no requirement to repeat the terms plane and axis in the answer.

**2 marks**

## Response C

Agonist: Pectoral major

Plane: Transverse

Axis: longitudinal

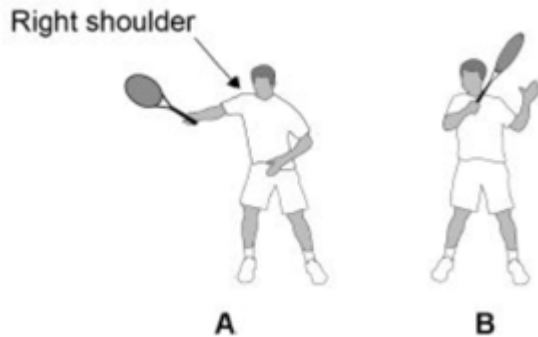
Response C is awarded full marks. They are correct in identifying the 'Pectoral major' as an agonist. Unlike with the deltoid muscle group, where it is very clear one part of the muscle is causing the movement shown, there is no requirement in this question to differentiate between pectoralis major and minor. One or both may be active depending on the path of the racquet during the stroke. Any reference to the pectorals muscle group is creditworthy.

**3 marks**



### Question 04.2 (2018)

In the diagram below, the main muscle fibre type used for a powerful forehand stroke is fast glycolytic (type IIx).



### Question

State **three** characteristics of this muscle fibre type.

**[3 marks]**

### Mark scheme

**AO1 = 3**

Accept first three answers only.

Award one mark for each of the following up to a maximum of three marks.

- Large motor neurone size
- Large muscle fibre diameter
- More sarcoplasmic reticulum development
- High PC stores
- High glycogen stores
- Low mitochondrial density
- Low myoglobin content
- Low capillary density
- High myosin ATPase/glycolytic enzyme activity
- High fatigability / low aerobic capacity / high anaerobic capacity
- High force production / speed of contraction
- White in colour

Accept other appropriate characteristics of fast twitch glycolytic muscle fibres (type IIx).

## Student responses

## Response A

1. High anaerobic capacity
2. Low myoglobin stores
3. High fatiguability

The question does not differentiate between structural and functional characteristics, so both are acceptable. The most common errors are repeating points deemed too closely linked and therefore on the same line of the mark scheme. This is seen here where bullet point 10 has been credited for point 1 so cannot be credited again for point 3.

**2 marks**

## Response B

1. Speed and ~~for~~ strength of contraction is very high
2. The muscle fibre fatigues quickly
3. It has a low affinity of myoglobin and mitochondria and a high capillary density

It is important that for this question that only the first three answers are considered. Very high speed and strength of contraction are deemed as one point as they are on the same line of the mark scheme, and both next to point one, therefore not a repeat. However, even if the candidate had correctly identified 'low capillary density' at the end of the last sentence this would not have been credited as 'low affinity of myoglobin and mitochondria' is their third point and is incorrect.

**2 marks**

**Question 05.1 (2019)**

Describe the process of gas exchange which occurs at a muscle.

**[3 marks]****Mark scheme****AO1 = 3**

- Oxygen diffuses from the capillary to the muscle cells and carbon dioxide diffuses from the muscle cells to the capillary. (1)
- Oxygen/carbon dioxide moves from areas of high concentration/partial pressure to areas of low concentration/partial pressure. (1)
- Myoglobin transports and stores oxygen in the muscle/has a higher affinity to oxygen than haemoglobin/pulls more oxygen in to the muscle. (1)

Accept any other appropriate description of how gas exchange occurs at a muscle.

**Student responses****Response A**

Haemoglobin will collect 4 oxygen molecules at the alveoli becoming oxyhaemoglobin. It will then travel to the working muscles. Here oxygen will diffuse into the muscle while  $\text{CO}_2$  diffuses out. At the muscle oxygen has a lower affinity for haemoglobin and will therefore dissociate (oxyhaemoglobin dissociation curve). Myoglobin (muscle haemoglobin) is present in the muscle.

Response A is awarded no marks as, while there is some correct information, none of the answer addresses the question which has been set. The only part which comes close is the mention of 'myoglobin' being present in the muscle. However, please note that, unlike in previous specifications, the mere mention of myoglobin is no longer creditworthy and requires a description of its role for the mark to be awarded.

**0 marks**

## Response B

Haemoglobin in the blood carries <sup>oxygen</sup> ( $O_2$ ) to the muscles where ~~it~~ it diffuses across a short diffusion pathway through the ~~muscle~~ wall of capillary and muscle to the myoglobin. The myoglobin has a higher affinity for  $O_2$  than haemoglobin creating a gradient for the  $O_2$  to diffuse down.

Response B has outlined that myoglobin 'has a higher affinity for  $O_2$  than haemoglobin' and is, therefore, awarded bullet point 3 on the mark scheme. Bullet point 1 does not secure a mark, however, as the direction of movement of both oxygen and carbon dioxide are required. While they use the word 'diffusion' they do not define it/demonstrate an understanding of the process so also do not achieve bullet point 2 on the mark scheme.

**1 mark**

## Response C

Blood in the capillary arrives at the muscle with high partial pressure of oxygen and low concentration of carbon dioxide. In the muscle there is high partial pressure of carbon dioxide and low oxygen concentration. Oxygen will diffuse from vessel to muscle. Carbon dioxide will diffuse from muscle to capillary.

Response C is awarded two marks as they describe the direction of movement of oxygen and carbon dioxide (bullet point 1 on the mark scheme) and clearly demonstrate knowledge that this process occurs due to the differing partial pressure which exist in the capillary and muscle (bullet point 2 on the mark scheme). There is no mention of myoglobin.

**2 marks**

### Question 03.3 (2020)

Explain how smoking regularly would impact the performance of the runners in the marathon.

[2 marks]

### Mark scheme

#### AO2 = 2

- Reduced gaseous exchange in the lungs/oxygen transport to the muscles (1).
- This decreases the athlete's ability to utilise oxygen in energy production/work aerobically (1).
- This means they have less energy for their activity/slower time/fatigue quicker (due to working anaerobically) (1).

Accept other explanations of the impact on performance of the runners in the marathon.

### Student responses

#### Response A

Smoking regularly will have a very bad impact on the runner's performance due to the damage it can cause to the lining of the bronchi and bronchioles. Also, the performer will feel out of breath very quickly due to the irritation that smoking can cause to the trachea when inhaling and exhaling. As a result, the runner will not be able to perform to the best of their ability.

Response A is awarded no marks for this answer as it does not meet the demands of AO2. While they highlight some negatives of smoking, they fail to explain how these will impact the performance of runners in a marathon so these points are not creditworthy.

**0 marks**

## Response B

It would severely impact their performance as carbon monoxide would saturate the haemoglobin which prevents the oxygen binding. This reduces the O<sub>2</sub> carrying capacity so less will be taken to the working muscles. This may result in a lower lactate threshold so they have to run slower to prevent lactate build up.

Response B is awarded two marks as they are able to expand on the negatives of smoking (carbon monoxide would saturate the haemoglobin) to explain the impact on the running. They cite 'this reduces the O<sub>2</sub> carrying capacity' (bullet point 1 on the mark scheme) and 'run slower to prevent lactate build up' (bullet point 3 on the mark scheme).

**2 marks**



### Question 04.2 (2020)

Outline **two** ways an active lifestyle can reduce the risk of heart disease.

[2 marks]

#### Mark scheme

**AO1 = 2**

- Decrease in cholesterol/LDL/fat in coronary arteries (1).
- Lower blood pressure (1).
- Stronger heart/cardiac hypertrophy/higher stroke volume (1).

Do not accept decrease in HDL.

Accept first two answers only.

Accept any other appropriate outline of how an active lifestyle can reduce the risk of heart disease.

#### Student responses

##### Response A

- 1 reduces fatty build up
- 2 Improves heart strength and endurance

Response A is awarded one mark for 'Improves heart strength' in line with the third bullet point on the mark scheme. They do not pick up the second mark as their first point does not specify where fatty build up is reduced. Answers relating to bullet point 1 on the mark scheme must be related to the coronary arteries to be credited.

**1 mark**



**Question 05 (2022)**

If endurance events take place in warm conditions, cardiovascular drift can occur.

Analyse how cardiovascular drift may result in lower levels of performance.

**[3 marks]**

**Mark scheme**

**AO3 = 3**

- Athletes will sweat reducing the plasma volume of blood. (1)
- Blood becomes more viscous/thicker which reduces venous return. (1)
- Due to **Starling's law** stroke volume/ejection fraction will decrease. (1)
- As **stroke volume/ejection fraction** decreases **heart rate** increases to maintain/increase **cardiac output**. (1)
- Having a higher heart rate at a lower than normal intensity increases the athlete's rate of perceived effort/the performer mentally thinks they are working harder than they are. (1)

Accept any other appropriate analysis of how cardiovascular drift may result in lower levels of performance.

**Student responses****Response A**

cardiovascular drift can cause dehydration ~~which results~~ as performers will sweat in warm conditions this will lead to a decrease in performance. This may cause athletes 'hit the wall' earlier making it more difficult to last till the end of the race meaning performance will suffer.

This response fails to access any of the available marks. Sweat on its own is not creditworthy as this is an AO3 analyse question. Students are required to make links between causes (eg sweating) and effects (eg reducing the plasma volume of blood).

**0 marks**

## Response B

cardiovascular drift is during a hot environment a performer begins to sweat. This results in a loss of fluid and a decreased plasma volume. Cardiac output decreases alongside stroke volume due to Starling's Law. Therefore, heart rate has to increase to compensate. This means performers may become dehydrated and lack performance whilst endurance of the activity.

This response achieves point 1, point 3, and point 4 from the mark scheme. Point 4 is awarded as the candidate correctly analyses the relationship between the three key terms highlighted. While this does not mirror the mark scheme wording, it is correct as the words 'to compensate' show an understanding of what is occurring to maintain cardiac output.

**3 marks**

## Applied anatomy and physiology – Extended response questions

### Question 05 (2020)

Analyse how changes in venous return occurring during exercise help performance in aerobic events such as a triathlon.

**[8 marks]**

### Mark scheme

#### Level 4

7-8 marks

- Knowledge is consistently accurate and well detailed.
- Application of breadth or depth of knowledge is clearly evident.
- Analysis and/or evaluation is coherently and consistently made between different relevant factors and their impact.
- Relevant terminology is consistently used.
- The answer almost always demonstrated substantiated reasoning, clarity, structure and focus.

#### Level 3

5-6 marks

- Knowledge is usually accurate and detailed.
- Application of breadth or depth of knowledge is often evident.
- Analysis and/or evaluation is often made between different relevant factors and their impact, and is usually coherent.
- Relevant terminology is often used.
- The answer usually demonstrates substantiated reasoning, clarity, structure and focus.

#### Level 2

3-4 marks

- Knowledge is sometimes accurate with some details.
- Application of breadth or depth of knowledge is sometimes evident.
- Analysis and/or evaluation is sometimes made between different relevant factors and their impact, but may lack coherence. Relevant terminology is sometimes used.
- The answer occasionally demonstrated substantiated reasoning, but may lack clarity, structure and focus.

#### Level 1

1-2 marks

- Knowledge may be limited.
- Application of breadth or depth of knowledge may be limited or not evident.
- There may be little or no analysis and/or evaluation between different relevant factors and their impact.
- Relevant terminology is occasionally used.

The answer may lack substantiated reasoning, clarity, structure and focus.

0 mark

No relevant content.

**Possible content may include:**

**AO1** Knowledge of venous return mechanisms

- Reference to and description of venous return mechanisms:
  - valves – prevent backflow of blood
  - skeletal muscle pump – working muscles contract and compress veins to push blood back towards the heart
  - respiratory pump – increased respiration/changes in pressure in the thorax compress veins to push blood back towards the heart
  - smooth muscle – found in veins and contracts to push blood back towards the heart
  - suction pump of the heart – pulls blood back toward the heart.

**AO2** Application to increased venous return during exercise

- Changes in venous return during exercise:
  - during exercise increased use of muscles in arms (swimming) and legs (swimming, cycling, running) compresses veins more pushing more blood back to the heart
  - increased breathing rate during exercise causes increased effect of respiratory pump returning more blood to the heart
  - suction pump of the heart increase as the heart beats harder and faster during exercise
  - overall increase in venous return during exercise.

**AO3** Analysis of reasons why these changes are required to occur

- Starling's law.
- This causes the heart muscle to stretch more increasing ejection fraction/stroke volume/cardiac output.
- More blood leaving the heart means more blood sent to the lungs for greater gas exchange (removal of CO<sub>2</sub> and uptake of O<sub>2</sub>).
- More blood to working muscles supplying O<sub>2</sub> for resynthesis of ATP.
- The more O<sub>2</sub> that is supplied the longer the performer can work aerobically for, limiting the production of fatiguing by-products such as lactate.
- Can work at higher intensities for longer periods of time.

Accept any other appropriate analysis of how changes in venous return, which occur during exercise, allow performance in aerobic events such as a triathlon.

## Student responses

## Response A

Venous return is the return of blood to the right side of the heart via the vena cava. Venous return contains 5 mechanisms which occur during exercise to help performance such as a triathlon. First mechanism is the skeletal pump. This pumps blood to the changing shape of muscles during movement to allow more oxygen to the demand of the working muscles. The respiratory pump is the contraction that occurs as we inspire and expire. This occurs due to pressure changes. This would maintain breathing as it increases. The pocket valve. The pocket valve allows blood flow to travel in one direction and prevent backflow.

Extra space with the blood travelling in one direction thus allows a continuous circuit of sufficient blood being passed through the body from the heart, delivering blood to the working muscles during the triathlon. The smooth muscle pump squeeze the blood around the body while the suction pump displays the pumping action of the heart again both delivering blood around the body for sufficient oxygen to working muscles. allowing an individual to go for much longer during the triathlon.

**This is a Level 2 response**

Response A is awarded 3 marks as almost the entirety of the answer is made up of AO1 knowledge simply describing the venous return mechanisms. There is one small section of AO2 which refers to the impact of valves on the direction of blood flow and delivery of oxygen to the working muscles, but this is limited. Had the answer contained only AO1, it would have been limited to Level 1/2 marks. The small bit of AO2 moves it to the bottom of Level 2/3 marks but no further.

**3 marks**



## Response B

Venous return mechanisms in the body help to return blood back to the heart. Pocket valves are located in the veins to help prevent backflow of blood. Smooth muscle is also a venous return mechanism located in the muscles themselves to help push blood back up to heart. Both of these mechanisms work at rest, however during exercise the respiratory and muscles are included. The muscles press on the veins to increase the amount of blood which is pushed through \* and the respiratory muscles compress the \* and back to heart.

blood back to heart.

This is useful for a marathon as more stroke volume will increase due to Starling's law, where there is more elasticity in the heart therefore a more powerful contraction leading to more ejection fraction. As more stroke volume has increased it means that more oxygen will be transported around the body which is good for a marathon as it is an aerobic endurance event.

This means that they can sustain their pace while running, cycling and swimming for longer as there is a richer supply of blood at the muscles, meaning they will have quicker times.

The pocket valves also help the marathonist as it prevents blood pooling especially in their legs during the cycling and running stages of the marathon.

### This is a Level 3 response

Response B is awarded 5 marks as, in addition to describing venous return mechanisms (AO1), they are also able to apply their knowledge to indicate that during a triathlon venous return would increase (AO2). In addition, they bring in their knowledge of Starling's Law to analyse the impact of this increase on cardiac output and performance (AO3). This is a Level 3 answer as opposed to Level 4 as it does not provide sufficient depth regarding how each mechanism changes during a triathlon or how this will positively affect performance.

**5 marks**



### Question 06 (2022)

Evaluate the effectiveness of altitude training for an endurance athlete preparing for a one-off event like the London Marathon.

**[8 marks]**

### Mark scheme

#### Level 4

7-8 marks

- Knowledge is consistently accurate and well detailed.
- Application of breadth or depth of knowledge is clearly evident.
- Analysis and/or evaluation is coherently and consistently made between different relevant factors and their impact.
- Relevant terminology is consistently used.
- The answer almost always demonstrated substantiated reasoning, clarity, structure and focus.

#### Level 3

5-6 marks

- Knowledge is usually accurate and detailed.
- Application of breadth or depth of knowledge is often evident.
- Analysis and/or evaluation is often made between different relevant factors and their impact, and is usually coherent.
- Relevant terminology is often used.
- The answer usually demonstrates substantiated reasoning, clarity, structure and focus.

#### Level 2

3-4 marks

- Knowledge is sometimes accurate with some details.
- Application of breadth or depth of knowledge is sometimes evident.
- Analysis and/or evaluation is sometimes made between different relevant factors and their impact, but may lack coherence.
- Relevant terminology is sometimes used.
- The answer occasionally demonstrated substantiated reasoning, but may lack clarity, structure and focus.

#### Level 1

1-2 marks

- Knowledge may be limited.
- Application of breadth or depth of knowledge may be limited or not evident.
- There may be little or no analysis and/or evaluation between different relevant factors and their impact.
- Relevant terminology is occasionally used.
- The answer may lack substantiated reasoning, clarity, structure and focus.

0 mark

No relevant content.

**Possible content may include:**

**AO1** Knowledge of altitude training

- Training at more than 2000m/8000 feet above sea level.
- Usually for at least 30 days/month.
- Three phases – acclimatisation, primary training, recovery.
- Partial pressure of oxygen is lower/less oxygen available.
- Body produces erythropoietin/EPO.
- Higher EPO levels increase red blood cell count.

**AO2** Application of altitude training to endurance sports

- Marathon is a long duration, low intensity/aerobic event and altitude training will specifically boost aerobic power/VO<sub>2</sub> max.
- Increased concentration of haemoglobin provides endurance athlete with increased capacity to carry oxygen.
- Increased myoglobin in muscle cells allows more oxygen to be stored and transported to mitochondria.
- Altitude sickness which may prevent the athlete from training.
- Training at same intensity as at sea level is very difficult so detraining/loss of fitness may occur.
- Benefits can be lost within few days back at sea level/up to few days so may have no impact on competition.
- Psychological problems linked to travel/time away from home may have detrimental effect on athlete's health and well-being.
- Altitude training is very expensive/time consuming so not available to most athletes preparing for endurance events such as the London Marathon.

**AO3** Evaluation of the effectiveness of altitude training to improve the performance of endurance athletes preparing for a one-off event such as the London Marathon

- Increase in VO<sub>2</sub> max will allow the endurance athlete to perform at high intensities for longer periods of time whilst still working aerobically.
- This will result in a higher average speed over the duration of the event which is a key factor in determining the outcome.
- As benefits only last for up to 14 days training must be performed close to the event to be effective, however travelling close to a race may also have a negative impact on performance in the race.
- If it is correctly timed the gains in aerobic power could be the difference between winning and losing the event.
- Loss of fitness/detraining/negative impact on mental health close to event may result in worse performance in the marathon if training is not properly managed.
- Some of these issues can be overcome with new methodologies such as live high train low or new technology such as hypoxic tents to sleep in.

Accept any other appropriate evaluation of the effectiveness of altitude training to improve the performance of endurance athletes preparing for a one-off event such as the London Marathon.

## Student responses

## Response A

Altitude training is at least 1500m above sea level and lasts for a minimum of 30 days. Due to the lower oxygen levels the haemoglobin isn't fully saturated with oxygen. This causes the stimulation of EPO to be produced causing an increase in red blood cells. Due to the increase in red blood cells the aerobic system is developed.

Altitude training is good for an event such as the London  
Extra space marathon as the aerobic system is developed. Through more red blood cells being produced the body is able to carry more oxygen meaning the muscles can receive oxygen quicker. This results in a marathon runner being able to use the aerobic system for longer at a higher intensity, increasing their likelihood of placing higher.

Altitude training is less effective as altitude sickness prevents the athlete from being able to train. If the athlete can't train this means their fitness will decrease causing them to place lower in the marathon.

Altitude training is effective as it increases capillarisation in the ~~to~~ lungs. This means gas exchange can occur faster resulting in the performer being able to respire aerobically for longer at higher intensities. Meaning the runner can place higher in the race / keep up with pack.

Altitude training is less effective due to psychological problems such as feeling homesick. Feeling home sick could result in demotivation meaning the performer won't train as hard limiting altitude training's effectiveness. This means the performer's fitness could stay the same or decrease leading to a lower place in the race.

**This is a Level 3 response**

A reasonably balanced response covering all AOs. This is a top of Level 3 response. Comparison to Response B should make it clear what is required in addition to access higher marks.

**6 marks**

## Response B

Altitude training is training done at 2000 - 2500 m above sea level. Phase 1 of the altitude training involves acclimatisation to the environment as there is low partial pressure of oxygen. Phase 2 is where training occurs for 5 - 7 days. Training is done aerobically still above sea level. Phase 3 involves 3 - 4 days recovery from ~~sea~~ training before returning back to sea level. When returning back to sea level

myoglobin stores become fully saturated as there is lots of oxygen available in comparison to at 2000m - 2500m  
Extra space above sea level. ~~Altitude~~

Altitude training ~~is~~ is effective for an endurance runner as returning back to sea level after training at high altitudes creates adaptations such ~~as~~ as fully saturated myoglobin, <sup>more</sup> oxidative enzymes, more haemoglobin and improved aerobic capacity. Improved aerobic capacity means the athlete can stay working aerobically for longer at a higher ~~intensity~~ intensity so performance is improved and they can get a faster ~~see~~ time in the marathon. Working aerobically for longer also means their lactate threshold is higher so they don't go into anaerobic exercise soon and experience OBLA which will produce lactic acid and cause fatigue and slow their time down. Altitude training is most effective if done ~~up to~~ close to the event for example 1 week before



as aerobic capacity will be improved so performance will increase.

However altitude training may not be effective as being at high altitudes can cause side effects such as altitude sickness so the performer won't be able to train as hard whilst at high altitudes so the effects of altitude training won't be as effective in improving aerobic capacity. Altitude training effects only last for 14 days after returning back to sea level ~~and~~ and it is very time consuming so may not be as accessible for some athletes. An alternative to going to the extremes of high altitudes would be to use a hypoxic tent which has the same effects as altitude training without side effects such as altitude sickness or not having time to do it but still improves aerobic capacity so performance in the marathon improves.

#### This is a Level 4 response

A good example of a full mark answer, even if the AO1 section was slightly reduced. The AO2 is clear and accurate, while the AO3 is articulate in providing both sides of the argument. This is a good reference point to ensure you are confident awarding full marks when marking this item.

**8 marks**

### Question 07 (2019)

Wayde van Niekerk set a new world record in the 400m at the 2016 Summer Olympics in Rio de Janeiro. Table 1 shows his 50m split times from the race.

Analyse the use of the anaerobic energy systems during the 400m race and their impact on the split times.

**[15 marks]**

### Mark scheme

#### Level 5

13-15 marks

- Knowledge is consistently comprehensive, accurate and well detailed.
- Application of breadth or depth of knowledge is clearly evident.
- Analysis and/or evaluation is coherently and consistently made between different relevant factors and their impact.
- Relevant terminology is almost always used.
- The answer demonstrated an high level of sustained reasoning, clarity and focus.

#### Level 4

10-12 marks

- Knowledge is usually comprehensive, accurate and detailed.
- Application of breadth or depth of knowledge is often evident.
- Analysis and/or evaluation is often made between different relevant factors and their impact, and is usually coherent.
- Relevant terminology is usually used.
- The answer usually demonstrates substantiated reasoning, clarity, structure and focus.

#### Level 3

7-9 marks

- Knowledge is generally accurate and sometimes detailed.
- Application of breadth or depth of knowledge is sometimes evident.
- Some analysis and/or evaluation is made between different relevant factors and their impact but may sometimes lack coherence.
- Relevant terminology is used but may sometimes be missing.
- The answer sometimes demonstrated substantiated reasoning, clarity, structure and focus.

#### Level 2

4-6 marks

- Knowledge is sometimes accurate but may lack detail.
- Application of breadth or depth of knowledge is occasionally evident.
- Some analysis and/or evaluation is attempted between different relevant factors and their impact, but is likely to lack coherence.
- Relevant terminology is occasionally used.
- The answer occasionally demonstrated substantiated reasoning, but may lack clarity, structure and/or focus at times.
-



**Level 1**

1-3 marks

- Knowledge is limited and may lack accuracy and detail.
- Application of breadth or depth of knowledge is likely to be limited or not evident.
- There may be very little or no analysis and/or evaluation made between different relevant factors and their impact.
- Relevant terminology used only very occasionally.
- The answer often lacks substantiated reasoning, clarity, structure and/or focus.

0 marks

No relevant content.

**Possible content may include:**

**AO1** Knowledge of ATP-PC and anaerobic glycolytic system

- Anaerobic respiration occurs in the absence of sufficient oxygen
- The ATP-PC system resynthesises ATP by breaking down phosphocreatine
- The energy released by splitting this molecule is used to re-attach a third phosphate to adenosine diphosphate
- The ATP-PC system can only last between 8 and 10 seconds
- 1:1 ratio/1 ATP resynthesised
- PC stores in the muscle become depleted and cannot be replenished during the race/without oxygen
- The anaerobic glycolytic system breaks down glycogen using anaerobic glycolysis to resynthesis ATP
- 1:2 ratio/2 ATP resynthesised
- Produces lactic acid as a waste product
- This builds up in the muscles and cannot be removed until the body is respiring aerobically.

**AO2** Application of ATP-PC and anaerobic glycolytic system to the 400m and split times

- Initially energy provided by existing stores of ATP
- During the first two splits Wayde van Niekirk will predominately be using the ATP-PC energy systems
- This energy system will have been exhausted at around 8-10 seconds/100m of the race
- Anaerobic glycolytic system will be the primary energy system used for the remainder of the race.

**AO3** Analysis of the energy system used on the split times

- Second split fastest due to fewer chemical reactions involved in/immediacy of ATP-PC system
- Then all van Niekirk's times are all slower than 4.7 seconds
- This is due to the larger number of chemical reactions involved in the anaerobic glycolytic system
- The athlete then continues to slow with each of the splits after the 2nd slower than the previous one
- Leading to the final and slowest time of 6.2 seconds.

- This occurs as they are continuing to work anaerobically using the anaerobic glycolytic system without rest or enough oxygen to meet the demands of the activity so lactic acid will be accumulating in their muscles
- Lactic acid denatures the enzymes involved in respiration meaning the muscle cells become slower at resynthesising ATP
- Even though van Niekirk slows over the course of the race he was still able to set a new world record
- This is because he is highly trained and among other things will have developed a high tolerance to lactic acid.

Credit other relevant analysis of how anaerobic energy systems impact on the split times.

## Student responses

### Response A

The anaerobic systems are the ATP, ATP-PC and anaerobic glycolytic system. The ATP provides energy for the first 2 seconds of exercise. Once this is used it needs resynthesising as ATP is the only usable form of energy. The ATP-PC system is the predominate anaerobic energy system in the first 100m. The ATP-PC system lasts about 8 seconds. Once that is over the anaerobic glycolytic system kicks in for the remaining. Overall in the 400m this is the predominate energy system. Lasting up to 3 minutes. The Wayne Van Niekirk world record being 43.1 seconds.

The anaerobic systems are the ATP, ATP-PC and anaerobic glycolytic system. The ATP provides energy for the first 2 seconds of exercise. Once this is used it needs resynthesising as ATP is the only usable form of energy. The ATP-PC system is the predominate anaerobic energy system in the first 100m. The ATP-PC system lasts about 8 seconds. Once that is over the anaerobic glycolytic system kicks in for the remaining. Overall in the 400m this is the predominate energy system. Lasting up to 3 minutes. The Wayne Van Niekirk world record being 43.1 seconds.

### This is a Level 1 response

This answer includes the names of both anaerobic energy systems, with this knowledge applied to the 400m by stating when in the race they would be used. The knowledge is limited however, lacking detail and with no reference to how the energy systems resynthesise ATP. This limited knowledge, and absence of AO3, mean that the answer fails to move beyond Level 1. It was awarded the top mark in this band which is 3.

**3 marks**

## Response B

Both the ATP-PC system and the Anaerobic glycolysis system are used in the 400m event. They are used individually in different parts of the event.

The ATP-PC system breaks down phosphocreatine into phosphate, creatine and energy. The energy is used to combine ADP with phosphate to form 1 molecule of ATP. The ATP-PC system lasts for 8-10 seconds. This system would only be used during the first two split times, between 0-100m of the 400m because that adds up to 10.7 seconds meaning the ATP-PC system adds up to 10.7 seconds meaning the ATP-PC system is running out, and the lactate anaerobic system will take over. Over the first two split times that the ATP-PC system is used for, the time between 0-50m (6s) and 50-100m (4.7s) decreases. This is because as the system is used it is more efficient at breaking down phosphocreatine in the muscle and using it to provide ATP. This means that the 400m runner will speed up. Therefore the split times decrease the longer the ATP-PC system is used up to 10 seconds.

The lactate anaerobic system breaks down muscle glycogen into glucose. The glucose is broken down into pyruvic acid which forms lactic acid as there is no oxygen present. This process is called anaerobic glycolysis and forms 2 ATP and it takes place in the sarcoplasm of the muscle. It lasts between 10 seconds - 3 minutes so will be used for the remainder of the race after the ATP-PC system because the race lasts for 43 seconds. As the lactate system is used by the 400m runner, his split times consistently increase from 4.8s at the 100m-150m split time to 6.2s at the 350-400m split time. This shows a gradual increase in the time for each 50m that he runs. This is because the longer he uses the lactate anaerobic system, the more lactic acid builds up in the muscle due to there being no oxygen present. As lactate accumulates in the blood, lactate accumulation, the 400m runner's enzymes begin to denature reducing the effectiveness of the performer therefore lowering his speed over time.

Therefore, the ATP-PC system is used for the first 10 seconds and first 2 split times which show an increase in speed due to the breakdown of phosphocreatine stores and there is no by-product which is fatiguing. However as the ~~anaerobic glycolysis~~ <sup>lactate anaerobic</sup> system begins to be used split times start increasing due to the build up of lactic acid in the muscles.

**This is a Level 4 response**

Response B's knowledge of the anaerobic energy systems is detailed and accurate. Both of the energy systems are applied to the 400m race and frequently to the split times as well. There is evidence of analysis, but this is not always presented in the most coherent form. Highlighting that the slowdown in times is initially due to the increased number of chemical reactions taking place in the anaerobic glycolytic energy system, as opposed to simply referring to the ATP-PC system being more 'efficient', earlier in their answer would be one example of how they could have moved their answer toward the top band. In addition, some analysis of the times leading to a world record and how van Niekerk's energy systems are adapted to allow this would also have been required.

**10 marks**



### Question 07 (2022)

Each of the following athletes uses a different main energy system to resynthesise ATP during a race:

- Athlete A is a 100 m runner
- Athlete B is a 400 m runner
- Athlete C is a marathon runner

Analyse how **each** of the athletes could use different dietary supplements or manipulation to optimise their performance in a race.

Refer to the relevant energy systems throughout your answer

**[15 marks]**

### Mark scheme

#### Level 5

13-15 marks

- Knowledge is consistently comprehensive, accurate and well detailed.
- Application of breadth or depth of knowledge is clearly evident.
- Analysis and/or evaluation is coherently and consistently made between different relevant factors and their impact.
- Relevant terminology is almost always used.
- The answer demonstrated an high level of sustained reasoning, clarity and focus.

#### Level 4

10-12 marks

- Knowledge is usually comprehensive, accurate and detailed.
- Application of breadth or depth of knowledge is often evident.
- Analysis and/or evaluation is often made between different relevant factors and their impact, and is usually coherent.
- Relevant terminology is usually used.
- The answer usually demonstrates substantiated reasoning, clarity, structure and focus.

#### Level 3

7-9 marks

- Knowledge is generally accurate and sometimes detailed.
- Application of breadth or depth of knowledge is sometimes evident.
- Some analysis and/or evaluation is made between different relevant factors and their impact but may sometimes lack coherence.
- Relevant terminology is used but may sometimes be missing.
- The answer sometimes demonstrated substantiated reasoning, clarity, structure and focus.

#### Level 2

4-6 marks

- Knowledge is sometimes accurate but may lack detail.
- Application of breadth or depth of knowledge is occasionally evident.

## A-LEVEL PHYSICAL EDUCATION – 7582/1 - ANSWERS AND COMMENTARIES

- Some analysis and/or evaluation is attempted between different relevant factors and their impact, but is likely to lack coherence.
- Relevant terminology is occasionally used.
- The answer occasionally demonstrated substantiated reasoning, but may lack clarity, structure and/or focus at times.

### Level 1

1-3 marks

- Knowledge is limited and may lack accuracy and detail.
- Application of breadth or depth of knowledge is likely to be limited or not evident.
- There may be very little or no analysis and/or evaluation made between different relevant factors and their impact.
- Relevant terminology used only very occasionally.
- The answer often lacks substantiated reasoning, clarity, structure and/or focus.

0 mark

No relevant content.

### Possible content may include:

#### **AO1** Knowledge of energy systems and dietary supplements/manipulation

- Energy systems:
  - Aerobic system: main energy system during long duration/low intensity/3 minutes plus.
  - Anaerobic glycolytic system: main energy during high intensity/short duration/approximately 10 seconds–3 minutes.
  - ATP-PC system: main energy during high or maximal intensity/short duration/approximately 5–10 seconds.
- Dietary supplements/manipulation:
  - Creatine.
  - Sodium bicarbonate.
  - Caffeine.
  - Glycogen loading.

#### **AO2** Application of energy systems and dietary supplements/manipulation to each event

- **Athlete A – 100 m**
- ATP-PC system as 100 m is high or maximal intensity/short duration/majority of the race completed in under 10 seconds.
- Creatine.
- **Athlete B – 400 m**
- Anaerobic glycolytic system as 400 m is high intensity/short duration/lasts more than 10 seconds but less than 3 minutes.
- Sodium bicarbonate.
- Athlete C – Marathon
- Aerobic system as marathon is long duration/low intensity/lasts more than 3 minutes.
- Glycogen loading.



- Caffeine.

**AO3** Analysis of the impact of the dietary supplements/manipulation on the energy systems

- **Athlete A – 100 m**
  - Taking creatine may increase the 100m runner's phosphocreatine stores.
  - This will allow the sprinter to use this system for a longer period of time.
  - Preventing the slow down that occurs when switching to the anaerobic glycolytic system due to the increased number of chemical reactions it involves.
- **Athlete B – 400 m**
  - Taking sodium bicarbonate will buffer lactic acid produced by the anaerobic glycolytic system.
  - This will delay the negative effects of lactate on performance allowing the athlete to run at faster speeds for a longer period of time.
- **Athlete C – Marathon**
  - Glycogen loading will increase the athlete's stores of muscle/liver glycogen which is the fastest energy source to produce energy using the aerobic system via glycolysis.
  - Having more stored glycogen will allow the marathon runner to run faster for longer before their glycogen stores become depleted/they 'hit the wall'.
  - Delays the need to use fats via beta oxidation as the main energy source for aerobic respiration which takes more oxygen/time to breakdown resulting in the athlete having to run slower.
  - Alternatively, caffeine can increase the oxidation of fats allowing them to be used as a fuel source and sparing muscle glycogen stores until later in the race.

Accept any other appropriate analysis of how these athletes would use different dietary supplements or manipulation to optimise their performance in the race.

## Student responses

### Response A

ATP involves using 3 predominant energy systems to break down and resynthesise. Athlete A would use the ATP-PC system as runs 100m which is high explosive activity. This energy system lasts 10 seconds and breaks down 1 ATP using a coupled reaction of endothermic and exothermic reactions.

This system breaks down the energy is made up of 1 high energy creatine and phosphate bond. After 10 seconds of the 100m race the runner will trigger the release of creatine kinase. This breaks down the release of the creatine and phosphate bond to release energy for ATP resynthesis. The performer / 100m will utilise creatine supplements for an ATP-PC runner as this supplement delays so BLA which will allow the 100m runner to gain a faster running time than their opponents. Creatine increases PC stores so that energy can resynthesise quickly and provide an explosive boost of power so the 100m runner can gain an advantage when setting off from the blocks. This anaerobic capacity uses creatine for short burst of energy to increase the triggering of creatine kinase and resynthesis of energy more readily.

Extra space After 10 seconds athlete B who is a 400m runner will use the anaerobic glycolytic system. This involves the process of glycolysis to gain 2 ATP from the sarcoplasm of the muscle cell. Glycogen is broken down into glucose through glycogen phosphorylase. This is then broken down into pyruvic acid through PFK. If oxygen is not available this is converted into lactic acid through lactate dehydrogenase. A 400m runner would use caffeine supplements to improve mental alertness and gain quick reactions time. This can lead to the runner coming off the blocks faster and gaining

a faster head start over opponents.

This alerts a performer by speeding reaction time once the signal is shot to start the race. This will also allow the performer to react more readily by recruiting more fast twitch fibres (Type IIx).

This increase in contraction means the performer can make fast decisions to sprint on the final 100m. Physiologically caffeine will delay fatigue meaning the 400m will reduce DOMS and OBLA.

Athlete C is a marathon runner meaning they will use aerobic system providing oxygen for a sustained period of time for a low intensity activity. This aerobic system has 3 stages. The first stage is glycolysis and beta oxidation. Glycolysis involves glucose breaking down into glucose through glycogen phosphorylase. This is then broken into pyruvic acid. Beta oxidation starts with triglycerides being broken down into free fatty acids and glycerol. These produce acetyl-coenzyme A. Acetylco enzyme A diffuses into the mitochondria where it combines with citric acid to form oxaloacetic acid and produce 2 ATP, CO<sub>2</sub> and hydrogen ions. These hydrogens enter the electron transport chain and become oxidised producing 34 ATP and water. Sodium bicarbonate supplements should be taken in order to boost the aerobic system. Sodium bicarbonate neutralises lactic acid so a performer is able to reduce lactate levels to prevent cramp and go on for longer.

They are able to ~~not~~ increase the buffering capacity to move lactate in the blood so the marathon runner can gain a better position in the race. It also delays the effects of OBLA meaning fatigue is decreased and the marathon runner can finish at a faster time. This means the marathon runner can run for a ~~longer~~ shorter period of time compared to opponents as can remove lactate and fatigue less quickly.

**This is a Level 3 response**

Linking caffeine to improvements in alertness/reaction time is not credited for any event as not linked to the athlete's energy systems. Sodium bicarbonate or any dietary supplementation/manipulation can be credited as AO1 knowledge even when incorrectly applied. An inconsistent answer which addresses different parts of the question with mixed success. The 100m aspect of the question is tackled well covering all assessment objectives (AOs). However, the 400m and marathon aspects are less successful, particularly in relation to dietary supplements/ manipulation.

**7 marks**



## Response B

Athlete A uses the ATP-PC Energy System through their race, Athlete B uses the anaerobic glycolytic system and Athlete C uses the aerobic energy system.

Athlete A uses ATP-PC system which is where when one ATP is broken down using adenosine triphosphate

~~ATPase Phosphatase~~ Phosphocreatine stores are used to resynthesise the Adenosine di Phosphate using ~~the~~ a Phosphate ion from the Phosphocreatine store to be turned back into ATP which is a usable form of energy. Dietary supplements used in this form of exercise to optimise performance would be creatine monohydrate which the body makes naturally however some performers take it as a supplement to increase the intake, by taking the supplement it increases the Phosphocreatine stores by doing this it means that the ATP-PC system will be able to be used longer as there is a greater store of Phosphocreatine. This will allow the sprinter or the room to continue using the system for longer at the same intensity rather than having to use the anaerobic glycolytic which is slow to start. This will decrease race time due to maintaining intensity and provide a better chance of winning the race, however despite the benefits of increased explosive power and reduced fatigue the side effects of creatine are cramps, a reduction in aerobic performance and nausea but as this is a short event

Extra space the aerobic disadvantage wouldn't matter and this will increase performance.

Athlete B is using anaerobic glycolytic system which uses the sarcoplasm or the mitochondria to turn Citric acid into glucose and then into pyruvic acid is a process called glycolysis this ~~also~~ generates 2 ATP however also produces lactic acid and carbon dioxide which are by products and

Cause fatigue slowing the runner down and reducing performance however by taking Sodium bicarbonate which is a salt it promotes buffering in the blood which ~~also~~ reduces lactate threshold and O<sub>2</sub> debt which is the amount of O<sub>2</sub> that the body has to take up to get back to normal. It does this by neutralising the pH levels in the blood this then stops the baroreceptors reading how much lactic acid is in the blood this in turn reduces the onset of fatigue and O<sub>2</sub> debt allowing the long distance runner to continue running and ~~also~~ producing ATP through Glycolysis for a longer duration at a high intensity without decrease their time and give an advantage over the other athletes who may not have taken it however it does have side effects as dehydration, diarrhoea and cramps which could put the athlete off concentration and stop them performing at their ~~best~~ optimum which could lose them the race however it is used to supplement side effects won't be as drastic.

Athlete C is a marathon runner and uses the aerobic system this is where after Glycolysis like the anaerobic system it enters the Krebs cycle through an enzyme called Coenzyme A. In the Krebs cycle another 2 ATP are produced with by products of hydrogen and water due to hydrolysis then the electron chain takes over and 34 ATP are produced so overall 38 ATP are produced in the aerobic system.

This is as oxygen resynthesises ATP when broken down with all this energy it helps long distance athletes continue at high intensities. There are two dietary supplements that can help caffeine which is a stimulant that prohibits the break down of fats which can provide energy once glycogen stores are depleted allowing the runner

to continue longer without ~~fatigue~~ <sup>anaerobic</sup> system taking over meaning decreased time ~~but~~ <sup>but also</sup> glycogen loading which is 6 days before the person eats high protein high intensity track to deplete carbohydrates and glycogen stores then 3 days before eats high carbs with taking training reduced intensity this depletes glycogen stores then by replenishing doubles the stores on race day allowing for more energy less fatigue meaning a ~~win~~ <sup>win</sup> over the person that has fatigue earlier. however has effects of ~~stomach~~ <sup>stomach</sup> bloating which may reduce time as feel ill when ~~running~~ <sup>running</sup> with this when at the high intensity training due to lack of carbs and energy it may cause training to be ~~impossible~~ <sup>impossible</sup>

\* however it has side effects of diarrhoea and cramps which in a marathon race can cause a person's performance to be reduced and stops them increasing time

### This is a Level 5 response

An excellent answer in the middle of Level 5. For full marks, this response would have benefited from a better analysis of why extending the ATP-PC system would be beneficial for 100m sprinter (few chemical reaction mean faster resynthesis of ATP) and/or more depth in their AO3 linked to either caffeine or glycogen loading (both are limited). A point to note is that, if completed in enough depth, candidates can gain full marks by either talking about caffeine or glycogen on their own for the marathon.

**14 marks**



## Skill acquisition – Short answer questions

### Question 10.1 (2020)

Define bilateral transfer.

[1 mark]

### Mark scheme

#### AO1 = 1

Bilateral transfer: the transference of physical performance learned by one side of the body to the opposite side of the body (1).

Accept any other appropriate definition of bilateral transfer.

### Student responses

#### Response A

Bilateral transfer is when the learning of skill with one part of the body is transferred to another part of the body.

Response A does not achieve the mark for this question, as the answer does not indicate the movement of the skill across the body, from right to left or left to right.

**0 marks**

### Question 09.2 (2019)

State two ways a coach can encourage positive transfer of learning.

**[2 marks]**

### Mark scheme

**AO1 = 2**

- Making training realistic. (1)
- Ensuring the first skill is well learnt. (1)
- Slow planned progression. (1)
- Use of rewards/reinforcement to encourage positive transfer. (1)
- Make performer aware of opportunities for positive transfer/highlight similarities. (1)

Accept first two answers only.

Accept any other appropriate ways a coach can encourage positive transfer of learning to occur.

### Student responses

#### Response A

1 Praise telling them know they did well

2 extrinsic rewards- rewarding them for success- mecrar

Response A does not achieve both of the available marks as the answers are too similar. 'Praise' is awarded the mark for bullet point 4 on the mark scheme, therefore the second point 'extrinsic rewards' cannot be credited again for the same point on the mark scheme.

**1 mark**

Response B

- 1 By ensuring the skills known by an athlete are considered when teaching a new skill.
- 2 By reinforcement when positive transfer is occurring (via praise or reward).

Response B is also awarded one mark for correctly identifying reinforcement (bullet point 4 on the mark scheme). However, the first point is considered too vague for bullet point 3 as there is a lack of information about what the coach should do with this knowledge.

**1 mark**

Response C

- 1 The coach can ensure the skill is learnt thoroughly to match game situations
- 2 Give positive reinforcement so there is more chance of a similar situation being performed.

Response C correctly identifies the skill should be learned 'to match game situation' (bullet point 1 on the mark scheme). This point would not have been awarded for bullet point 2 on the mark scheme as for this point the response would need to specify that it was the first skill which needs to be learned thoroughly. In addition, the answer also identifies positive reinforcement for bullet point 4.

**2 marks**

### Question 11.1 (2019)

Give one example of positive feedback and one example of negative feedback in athletics.

[2 marks]

### Mark scheme

AO2 = 2

- Example of positive feedback in athletics – praise when your hurdle technique was good / equivalent. (1)
- Example of negative feedback in athletics – criticism when you didn't keep your lead leg straight when hurdling / equivalent. (1)

Accept any other appropriate examples of positive and negative feedback. Examples must be specific to athletics. Do not credit 'praise' or 'criticism' without an example.

### Student responses

#### Response A

Positive *The coach saying well done/giving praise about the performance*

Negative *The coach telling the performer how to correct their technique in order to counter errors.*

Response A identifies examples of both positive and negative feedback but has failed to read the question and ensure these examples are applied to the sport of athletics.

**0 marks**

#### Response B

**Positive:** verbally: "great sprint start" by telling them.

**Negative:** Constructive feedback. Telling them it was performed wrong or could have been better.

Response B does access one mark for this answer, as they have given a clear example of positive feedback following a sprint start in athletics. Their response to negative feedback, however, is a definition with no application.

**1 mark**

**Question 09 (2020)**

Negative reinforcement and punishment are key aspects of operant conditioning. Define the terms negative reinforcement and punishment.

Give a sporting example of each.

**[4 marks]**

**Mark scheme**

**AO1 = 2, AO2 = 2**

- Negative reinforcement: removal of an unpleasant stimulus to encourage desired response (AO1), coach stops shouting at a player when the performer does something well (AO2)
- Punishment: introduction of an unpleasant stimulus to break the SR bond/prevent the response from reoccurring (AO1), a red card/penalty is awarded after a foul has been committed (AO2)

Accept any other appropriate definitions or sporting examples of the terms negative reinforcement and punishment.

**Student responses****Response A**

Negative reinforcement Negative reinforcement is the removal of things that the athlete does not want. Example is, during or after performance the coach does not give the athlete any form of criticism or bad comment.

Punishment Punishment is the removal of things the athlete want. Example is, sending a player off during a game of football.

Response A is awarded one mark for correctly identifying an example of punishment in sport. Students are not required to get the definition right to be credited for the example. This response is not awarded any marks for the 'negative reinforcement' section due to not identifying, in the definition or example, that the removal of the unpleasant stimuli comes after successful performance/to strengthen the S-R bond. The definition of punishment is clearly incorrect compared to the mark scheme.

**1 mark**

## Response B

Negative reinforcement - The removal of a negative thing e.g. if you miss a layup in game you have to stay 10 minutes after practice. but if you make it you can leave.

Punishment - Introduction of a negative thing due to an action e.g. miss a layup in game then you must do 10 pushups.

Response B is awarded two marks as their examples are correct. The definitions are incorrect, and do not identify the purpose/timing of negative reinforcement and punishment.

**2 marks**

## Response C

Negative reinforcement is withdrawing an unpleasant stimulus when the skill has been performed correctly so it can happen again.

For example in badminton, criticism of hand grip will be withdrawn when athlete has corrected their correct hand grip.

Punishment is presenting the individual with an unpleasant stimulus so the action/skill doesn't re-occur.

For example if an individual shows aggression they may be sent off pitch during a football game to avoid this happening in the future.

Response C is successful in accessing all four marks for this question. Both the definition and example of negative reinforcement recognise that the removal of an unpleasant stimuli occurs after successful performance. In addition, the definition and example of punishment highlights that it occurs to stop the incorrect action reoccurring.

**4 marks**

### Question 11 (2020)

Discuss the effectiveness of using massed practice with performers in gymnastics.

**[4 marks]**

### Mark scheme

**AO2 = 4**

For (sub max 3)

- Helps develop motor programmes/allows overlearning of a named gymnastic skill or routine (1).
- Increased sports specific fitness due to repeatedly performing a named gymnastic skill or routine (1).
- Time efficient which may allow the learning of a specific routine in the lead up to a competition (1).
- Particularly suited to closed, self-paced skills like a gymnastics routine (1).
- Against (sub max 3)
- Limited time for feedback which may limit error correction in named gymnastic skill or routine (1).
- Fatiguing which may cause a decrease in gymnastic performance/increased likelihood of injury in dangerous sport like gymnastics (1).
- Boring/demotivating when performing same named gymnastic skill or routine leading to lack of focus/decreased performance (1).

Must be a valid attempt to link advantages/disadvantages of massed practice to **gymnastic performance**.

Accept any other appropriate discussion of the effectiveness of using massed practice with performers in gymnastics.



## Student responses

## Response A

Massed practice involves continuously repeating skill with no rests, e.g. repeating ~~some~~ landing on vault 50 times. A benefit of massed practice is that the gymnast can learn kinaesthesia of technique as it is repeated many times. A negative ~~is~~ is that due to there being no rest ~~breaks~~ breaks, the performer may become fatigued and be unable to properly perform skill, and may end up learning incorrect way of completing skill.

This question is specifically assessing AO2, requiring students to apply their knowledge of massed practice to gymnastics. As there is no mention of any gymnastic skills, and only one passing mention of a 'gymnast', this response was awarded zero marks.

**0 marks**

## Response B

Massed practice will help performers in gymnastics as it will enable them to really overlearn a certain skill such as a Somersault. It will also be time efficient so the gymnast can not waste any time and keep developing the Somersault movement. However massed practice will lead to fatigue so either these gymnasts

have to be at a high level i.e. Autonomic or there performance will deteriorate through the practice session.  
 Extra space ALSO this type of practice can get boring after a while as the athletes are doing the same thing over and over this can lead to loss of concentration.  
 Also not much time for feedback during massed practice.

Response B applies knowledge of massed practice to the sport of gymnastics in most of their points. They link overlearning (bullet point 1 on the mark scheme) and time efficiency (bullet point 3 on the mark scheme) to a somersault. They also consider how fatigue, as a result of massed practice, would differ for gymnasts at different levels. Their final point 'not much time for feedback' is not awarded bullet point 5 on the mark scheme as this is not applied to gymnastics.

**3 marks**

## Question 12 (2022)

Figure 2 shows the impact of the number of possible responses on response time.

Analyse **Figure 2** to suggest why response times may be longer when passing in football than at the start of a 100 m race. Support your answer with data from **Figure 2**.

[3 marks]

## Mark scheme

### AO3 = 3

- Start of 100m has one possible response to stimuli which the graph suggests would result in a response time of 180 ms. (1)
- Passing in football has many possible responses so response time longer (must include relevant data from graph). (1)
- Passing in football represents choice reaction time which takes longer / this increase can be explained by Hicks Law. (1)

Accept any other appropriate analysis to suggest why response times may be longer when passing in football than at the start of a 100m race.

## Student responses

### Response A

The start of a 100m race involves simple reaction time as there is only 1 stimulus (shooting of the gun) and 1 possible response (pushing off the blocks to run). However, in football it involves choice reaction time as there is multiple stimuli (opponents, different players to pass to) and multiple responses of choosing where you're going to pass. ~~The~~ Response time increases as the amount of possible responses increase.

To be credited, data from the table must be specific and accurate. The response makes no explicit link between data from the table (11 responses = 640ms) and passing in football. The examiner must make this link for the student so no mark is awarded. Mark scheme point 3 is the point given.

**1 mark**

## Response B

At the start of a 100m race it uses simple reaction time as there is one stimulus ~~and~~ (gun) and one reaction (start sprinting). Whereas when passing in football there is choice reaction as there are multiple stimuli (opponents positioning) and multiple reactions (who and where the player passes). This explains why at 1st response the response time was 180ms compared to 640s ~~at~~ with 11 possible responses.

Point 1 credited linked to data at the bottom of the answer. Link is made in the response using the language 'This explains why...'. Point 3 awarded as reference to choice reaction (time) is made in the correct context. Finally, mark scheme point 2 is awarded again due to the link to data at the bottom of the answer indicated by the language 'This explains why...'.  
 3 marks

## Skill acquisition – Extended response questions

### Question 12 (2018)

Goalkeepers in hockey need to respond quickly to the actions of the attacking players. Analyse the factors which will affect the goalkeeper's response time and the strategies a coach can use to improve performance.

**[8 marks]**

### Mark scheme

**AO1 = 2, AO2 = 3, AO3 = 3**

Students are expected to answer in continuous prose, use good English, organise information clearly and use specialist vocabulary where appropriate.

#### Level 4

7-8 marks

- Knowledge is consistently accurate and well detailed.
- Application of breadth or depth of knowledge is clearly evident.
- Analysis and/or evaluation is coherently and consistently made between different relevant factors and their impact.
- Relevant terminology is consistently used.
- The answer almost always demonstrated substantiated reasoning, clarity, structure and focus.

#### Level 3

5-6 marks

- Knowledge is usually accurate and detailed.
- Application of breadth or depth of knowledge is often evident.
- Analysis and/or evaluation is often made between different relevant factors and their impact, and is usually coherent.
- Relevant terminology is often used.
- The answer usually demonstrates substantiated reasoning, clarity, structure and focus.

#### Level 2

3-4 marks

- Knowledge is sometimes accurate with some details.
- Application of breadth or depth of knowledge is sometimes evident.
- Analysis and/or evaluation is sometimes made between different relevant factors and their impact, but may lack coherence.
- Relevant terminology is sometimes used.
- The answer occasionally demonstrated substantiated reasoning, but may lack clarity, structure and focus.



## Level 1

1-2 marks

- Knowledge may be limited.
- Application of breadth or depth of knowledge may be limited or not evident.
- There may be little or no analysis and/or evaluation between different relevant factors and their impact.
- Relevant terminology is occasionally used.
- The answer may lack substantiated reasoning, clarity, structure and focus.

0 mark

No relevant content.

## Student responses

### Response A

The coach can do fitness drills to improve the goalkeepers endurance, teach them about anticipating which could reduce response time and ~~give~~ make the goalkeeper train with extra stimuli in ~~their~~ training so they are used to it. Extra space Finally, mental practice can also be used to decrease ~~their~~ response time.

Response time is the time it takes from the onset of the stimulus to the completion of the task (reaction time + movement time). The factors <sup>which</sup> ~~will~~ affect the goalkeepers response time are the number of stimuli present e.g. single-channel/hypothetical states we can only deal with one stimulus at a time so the more stimulus the slower the response will be (Hicks law). The ~~psychological~~ ~~motor~~ ~~stimulus~~ refractory period (PRP) suggests that there is a delay when a second stimulus is presented whilst the first stimulus is still being dealt with. Furthermore the fitness

of the performer will also effect response time as it ~~increases~~ <sup>decreases</sup> movement time.

### This is a Level 1 response

This answer only contains AO1 knowledge. There is no application to hockey/goalkeeper or analysis which means, despite the knowledge being good, the answer cannot be awarded more than 2 marks.

**2 marks**

### Response B

Response time is the time taken from the onset of a stimulus to the end of the ~~sk~~ performance. Response time can be affected by choices. Hick's law states that if there are a number of choices/decisions to make then response time will be slower. For a goalkeeper, they have a few decisions to make as they have to take into account the opposition, where they are positioned, where the ball is and what their team are doing especially the defenders. This law is not always true as as the number of choices increase response time isn't always slower. The single channel hypothesis also states that only one thing can be processed at a time and the psychological refractory period states that if a second stimulus comes before the first one has been processed then this could cause confusion. for a goalkeeper, they   
Extra space have a lot of stimulus to taken into account, and a coach could help them respond quicker by making the <sup>main</sup> stimulus (so the football) bright so that



they learn to focus on just that and not the opposition. In reverse the coach could make them train with distractions to allow them to ignore the irrelevant information so that their response to saving a goal will be much quicker.

**This is a Level 3 response**

Response B demonstrates less knowledge than Response A, but what they have is applied specifically to a goalkeeper (we overlooked the fact it was a goalkeeper in the wrong sport). Specific examples are given eg how Hicks Law would impact the goalkeeper's reaction time in a game. Towards the end, the response includes analysis of the strategies the coach could use to help the goalkeeper overcome some of the factors affecting their reaction time. This AO3 pushes them into the bottom of Level 3. To move towards the top level, the student would have needed to demonstrate greater breadth of knowledge regarding the factors/strategies and greater depth of analysis of how the strategies would impact the goalkeeper's reaction time/performance.

**5 marks**

### Question 13 (2022)

A high jumper is experiencing a learning plateau.

Evaluate the effectiveness of setting a SMARTER process goal to overcome this learning plateau. Refer to an appropriate goal in your answer.

**[8 marks]**

### Mark scheme

**AO1 = 2, AO2 = 3, AO3 = 3**

Students are expected to answer in continuous prose, use good English, organise information clearly and use specialist vocabulary where appropriate.

#### Level 4

7-8 marks

- Knowledge is consistently accurate and well detailed.
- Application of breadth or depth of knowledge is clearly evident.
- Analysis and/or evaluation is coherently and consistently made between different relevant factors and their impact.
- Relevant terminology is consistently used.
- The answer almost always demonstrated substantiated reasoning, clarity, structure and focus.

#### Level 3

5-6 marks

- Knowledge is usually accurate and detailed.
- Application of breadth or depth of knowledge is often evident.
- Analysis and/or evaluation is often made between different relevant factors and their impact, and is usually coherent.
- Relevant terminology is often used.
- The answer usually demonstrates substantiated reasoning, clarity, structure and focus.

#### Level 2

3-4 marks

- Knowledge is sometimes accurate with some details.
- Application of breadth or depth of knowledge is sometimes evident.
- Analysis and/or evaluation is sometimes made between different relevant factors and their impact, but may lack coherence.
- Relevant terminology is sometimes used.
- The answer occasionally demonstrated substantiated reasoning, but may lack clarity, structure and focus.

**Level 1**

1-2 marks

- Knowledge may be limited.
- Application of breadth or depth of knowledge may be limited or not evident.
- There may be little or no analysis and/or evaluation between different relevant factors and their impact.
- Relevant terminology is occasionally used.
- The answer may lack substantiated reasoning, clarity, structure and focus.

0 mark

No relevant content.

**Possible content may include:**

**AO1 Knowledge of learning plateau and goal setting**

- **Learning plateau**
  - A period of no improvement in performance/performance levels off.
  - Causes: lack of motivation/boredom/poor coaching/achieved potential set by ability/low targets/fatigue/insufficient fitness.
- **Goal setting**
  - A process goal is one which focuses on improving technique.
  - Goals should be specific; measurable; achievable; realistic; time bound; evaluated; re-done.

**AO2 Application of goal setting to the cause of a learning plateau and high jump**

- Setting effective goals would be beneficial if the cause of the plateau were motivational/technical.
- Setting goals correctly would increase motivation/force the performer to focus on specific weaknesses.
- An example of an effective process goal in this situation would be to push the hips up to arch the back on at least 9/10 attempts in the next session.
- Accept any appropriate process goal.
- Justification of why this is effective is AO3.

**AO3 Evaluation of goal setting to overcome this learning plateau**

- Setting goals would not be an effective strategy for overcoming a learning plateau if the cause were fatigue/poor coaching/lack of ability.
- In these situations, alternative strategies such as rest/a new coach would be more effective.
- A process goal would be most effective as they focus on the technique/avoid comparison with others.
- The performer can experience success without setting a new PB, which increases motivation.
- The example goal is specific as it focuses on a key technical element of high jump.
- It can be measured in terms of the number of times the high jumper performs the skill correctly.
- It is achievable and realistic as it is focused on a small technical improvement and not a new height or competition position.

- It is time bound as it is to be completed in the next session.

Accept any other appropriate evaluation of the effectiveness of setting a SMARTER process goal to overcome this learning plateau with reference to an appropriate goal.

## Student responses

### Response A

SMARTER stands for making a goal specific, measurable, achievable, realistic, time-bound, evaluative and redo-able. Also, a process goal is when a goal is set on improving technique and skill. ~~Therefore~~ In addition, a learning plateau is when the rate of learning stops.

Firstly, learning plateau may be caused by a lack of motivation. Therefore, if a high jumper sets a goal of achieving 5/8 jumps with a perfect arched back then Extra space they will strive to achieve this measurable element. This is because, having a numbered goal increases a performer's desire to before the skill correct to feel like they have succeeded in training.

Also, learning plateau can occur from a lack of or poor feedback. Therefore, making the goal evaluative ~~but~~ <sup>by</sup> marking a position for optimum take off and comparing to take-off performed, can allow for feedback to occur which could construct the high jumper's technique to be as good as possible. Seeing this improvement, and taking on feedback ~~can~~ <sup>could</sup> make the high jumper continue to learn the sport effectively.

Furthermore, learning plateau can occur due to completing a goal already. Therefore, making the goal redo-able reduces the chance of this occurring. For example, as the goal type is process goals, the high jumper can target all of the different skills used within a high jump - thus reducing the chances of the high jumper experiencing a learning plateau due to have completed their goal and not having another one.

**This is a Level 2 response**

The response demonstrates knowledge of both goal setting and learning plateau. They are also successful in identifying a process goal which would be applicable to a high jumper. Unfortunately, they fail to evaluate its impact and thus are not credited with any AO3 marks. The maximum mark for a response like this would be 5/8.

**4 marks****Response B**

SMARTER stands for specific, measurable, achievable, realistic, time bound, evaluate and Re-do.

A process goal aims to improve technique and as a result performance. A learning plateau is when a player stops progressing and has lost motivation to succeed and new goals are needed.

The high jumper may only be reaching 1.3m for a long time. So has lost motivation. They can set a ~~new~~ new goal e.g. By the end

of the year (3months) I want to achieve a better drive off the ground to achieve a height of 1.35m. This is specific to high jump, it is measurable (3months), it is within their capability (achievable), there is a realistic time frame and it is technique focused (drive off the lead leg).

A strength of process goals is they do not compare their jump to others. This will reduce anxiety in competition enabling optimum arousal to be reached and so a better jump will be performed.



Also, because they are focused on their own technique ~~and~~ it enables motivation to be given when they don't win as long as their jump push off improved. However, it could also decrease motivation to work hard as they aren't aiming to win  $\therefore$  they may remain in a learning plateau.

Finally, when evaluating whether a greater push off was achieved they can re-do/set the goal if 1.35m wasn't achieved and develop more power in their legs using plyometrics to achieve it next time.

However, there may be other causes for the learning plateau e.g. poor coaching which will not <sup>be</sup> resolved by smarter goals.

### This is a Level 3 response

This response has good knowledge which is applied to create an effective process goal for a high jumper. The AO3 has breadth and some depth as well as being balanced. This response does not make the top band, due to its failure to evaluate the goal they have set in relation to the SMARTER principles. They attempt this in paragraph 2 in the sentence starting 'This is specific...' but it is too limited, with inaccuracies, to be credited.

**6 marks**



### Question 13 (2020)

Baddeley and Hitch's memory model operates within the general information processing model.

Analyse how Baddeley and Hitch's model allows a performer to make effective decisions when passing in a game of basketball.

**[15 marks]**

### Mark scheme

#### Level 5

13-15

- Knowledge is consistently comprehensive, accurate and well detailed.
- Application of breadth or depth of knowledge is clearly evident.
- Analysis and/or evaluation is coherently and consistently made between different relevant factors and their impact.
- Relevant terminology is almost always used.
- The answer demonstrated an high level of sustained reasoning, clarity and focus.

#### Level 4

10-12

- Knowledge is usually comprehensive, accurate and detailed.
- Application of breadth or depth of knowledge is often evident.
- Analysis and/or evaluation is often made between different relevant factors and their impact, and is usually coherent.
- Relevant terminology is usually used.
- The answer usually demonstrates substantiated reasoning, clarity, structure and focus.

#### Level 3

7-9

- Knowledge is generally accurate and sometimes detailed.
- Application of breadth or depth of knowledge is sometimes evident.
- Some analysis and/or evaluation is made between different relevant factors and their impact but may sometimes lack coherence.
- Relevant terminology is used but may sometimes be missing.
- The answer sometimes demonstrated substantiated reasoning, clarity, structure and focus.

#### Level 2

4-6

- Knowledge is sometimes accurate but may lack detail.
- Application of breadth or depth of knowledge is occasionally evident.
- Some analysis and/or evaluation is attempted between different relevant factors and their impact, but is likely to lack coherence.
- Relevant terminology is occasionally used.
- The answer occasionally demonstrated substantiated reasoning, but may lack clarity, structure and/or focus at times.

### Level 1

1-3 marks

- Knowledge is limited and may lack accuracy and detail.
- Application of breadth or depth of knowledge is likely to be limited or not evident.
- There may be very little or no analysis and/or evaluation made between different relevant factors and their impact.
- Relevant terminology used only very occasionally.
- The answer often lacks substantiated reasoning, clarity, structure and/or focus.

0 mark

No relevant content.

### Possible content may include:

**AO1** Knowledge of Baddeley and Hitch's memory model and basic information processing model

- Baddeley and Hitch's memory model:
  - central executive – selects which information to send to each of the 3 subsystems
  - phonological loop – deals with sounds
  - visuospatial sketchpad – stores visual and spatial information
  - episodic buffer – sends sequences of information from the phonological loop and visuospatial sketchpad to the long-term memory.

**AO2** Application to passing in basketball

- Baddeley and Hitch's memory model:
  - central executive eg may ignore the noise from the crowd and send the sound of a coach giving instructions to the phonological loop
  - phonological loop eg the call of a team mate
  - visuospatial sketchpad eg the position of players on the court
  - episodic buffer eg initiates the motor programme to perform the pass.

**AO3** Analysis of role of memory model within decision making and production of an effective of pass

- During the input phase selective attention must be used to filter out irrelevant stimuli.
- Only relevant stimuli distributed by central executive.
- Prevents information overload.
- Must selectively attend to most relevant stimuli to perform a successful pass.
- Phonological loop, visuospatial sketchpad and episodic buffer work together to help the performer decide about the most appropriate course of action eg what type of pass to play, to who and when.
- The more experienced the performer is in the situation the more likely he will make an effective decision.
- Episodic buffer sends sequences of information to long-term memory to initiate a motor programme for the pass they want to play.
- The performer must have a well learnt motor programme for the pass if it is to be performed consistently well.

Accept any other appropriate analysis of how Baddeley and Hitch's model allows a performer to make effective decisions when passing in a game of basketball.

## Student responses

### Response A

Baddeley and Hitch's model says sensory information is picked up from sight, hearing, touch and kinesthetics. By using what they see, hear ~~and~~, feel and their knowledge of how they are positioned they can read the cues of the situation.

This is the detect stage. This image of the situation is then compared to the longterm memory to see if they have been in similar situations before, what action they took and the consequences of it last time.

The performer then recognises a suitable response that had the most positive outcome in the past. This DCR system occurs in a split second and allows performers to make the best move possible.

For the basketballer they would see the position of teammates and opponents, hear calls from teammates for the ball and be able to feel if they are

off balance and their positioning to make the best pass. They would compare this information with the long term memory and see that last time when they passed

off balance and their positioning to make the best pass. They would compare this information with the long term memory and see that last time when they passed to the wing there was a turnover so instead pass to the centre like another time that resulted in them scoring.

Extra space

This gives them an advantage as they can use their best option and knowledge from the past situations together to make the best pass.

### This is a Level 0 response

Response A fails to answer the question with none of the key terminology associated with Baddeley and Hitch's model evident. No credit can therefore be awarded.

**0 marks**



## Response B

Baddeley and Hitch's Working Memory Model takes in information from the environment and sends it to the central executive which controls the whole of the components. It sends the information to the relevant component. Visual information goes to the Visuo-Spatial Sketchpad and auditory information is sent to the phonological loop/store. For example in passing in basketball the player will see the other players on his team and this information will go to the Visuo-Spatial Sketchpad. This helps to make effective decisions as it helps select attention by focusing on the relevant stimuli of where to pass the ball into a free space to a player. This means his decision can be made quicker and more effectively as his select attention is only on one stimuli. \*

The player may hear other players shouting their name. <sup>Extra space</sup> ~~the~~ This information would be passed to the phonological loop/store where he may focus on that and decide whether to pass and move behind him or whether to move in another direction.

\* This also allows them to identify what kind of move or pass they will need to do so the defender don't intercept the ball.

### This is a Level 3 response

Response B has knowledge of 3 out of 4 of the main components of Baddeley and Hitch's model. They describe them and give sports specific examples. There is some limited AO3 analysis of how these components contribute to the player making effective decisions. To progress up the levels, the candidate would require a greater breadth of knowledge and application, with no obvious gaps, and their analysis would need to be more detailed, demonstrating greater depth of understanding of how the systems interact to produce correct decisions when passing in basketball.

**7 marks**



### Question 14 (2022)

Trampolinists A and B have both performed the same set routine on a number of occasions in training. For each attempt they have been awarded an execution score out of 10 by their coach, with 10 being the best possible score.

Table 1 shows the execution scores the trampolinists were awarded for each attempt. Evaluate whether massed practice or distributed practice would be most effective for their coach to use with:

- Trampolinist A
- Trampolinist B.

Refer to each trampolinist's stage of learning in your answer.

**[15 marks]**

### Mark scheme

#### Level 5

13-15 marks

- Knowledge is consistently comprehensive, accurate and well detailed.
- Application of breadth or depth of knowledge is clearly evident.
- Analysis and/or evaluation is coherently and consistently made between different relevant factors and their impact.
- Relevant terminology is almost always used.
- The answer demonstrated an high level of sustained reasoning, clarity and focus.

#### Level 4

10-12 marks

- Knowledge is usually comprehensive, accurate and detailed.
- Application of breadth or depth of knowledge is often evident.
- Analysis and/or evaluation is often made between different relevant factors and their impact, and is usually coherent.
- Relevant terminology is usually used.
- The answer usually demonstrates substantiated reasoning, clarity, structure and focus.

#### Level 3

7-9 marks

- Knowledge is generally accurate and sometimes detailed.
- Application of breadth or depth of knowledge is sometimes evident.
- Some analysis and/or evaluation is made between different relevant factors and their impact but may sometimes lack coherence.
- Relevant terminology is used but may sometimes be missing.
- The answer sometimes demonstrated substantiated reasoning, clarity, structure and focus.

#### Level 2

4-6 marks

- Knowledge is sometimes accurate but may lack detail.
- Application of breadth or depth of knowledge is occasionally evident.

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- Some analysis and/or evaluation is attempted between different relevant factors and their impact, but is likely to lack coherence.
- Relevant terminology is occasionally used.
- The answer occasionally demonstrated substantiated reasoning, but may lack clarity, structure and/or focus at times.

### Level 1

1-3 marks

- Knowledge is limited and may lack accuracy and detail.
- Application of breadth or depth of knowledge is likely to be limited or not evident.
- There may be very little or no analysis and/or evaluation made between different relevant factors and their impact.
- Relevant terminology used only very occasionally.
- The answer often lacks substantiated reasoning, clarity, structure and/or focus.

0 mark

No relevant content.

### Possible content may include:

**AO1** Knowledge of massed and distributed practice

#### Massed practice

- No rest.
- Advantages and disadvantages of massed practice stated in isolation. For example:
  - Good to use with closed skills where repetition is possible.
  - It promotes fitness/makes skills automatic/it is time efficient.
  - It can be tiring/result in negative transfer/performers need to be highly motivated.
  - Distributed practice
  - Includes rest intervals.
- Advantages and disadvantages of distributed practice stated in isolation. For example:
  - Good to use with open skills where the break can be used to explain changes.
  - Good to use with complex/externally paced skills to decrease the pressure on the performer.
  - Provides time for feedback/mental practice.
  - It is time consuming and may limit the speed of progress.

**AO2** Application of massed and distributed practice to trampolining

#### Massed practice

- The trampolinist would simply perform their routine/skills from their routine repeatedly for a period of time.
- Advantages and disadvantages of massed practice linked to trampolining. For example:
- As trampolining is a closed skill, massed practice could be used.
- The high fitness demands of trampolining may cause the performer to fatigue very quickly, increasing the risk of injury.
- **Distributed practice**
- The routine/skills from the routine would be performed with breaks in between for recovery.
- Advantages and disadvantages of distributed practice linked to trampolining. For example:

- As trampolining could be considered complex due to the high number of sub routines, distributed practice could also be used.
- The trampolinist could use this time to get extrinsic feedback from their coach or mentally practice the routine/somersault.

**AO3** Evaluation of whether massed or distributed practice would be most effective for a coach to use with:

- **Trampolinist A**

- Looking at the scores in Table 1 it would appear that Trampolinist A is an autonomous performer.
- This is due to the consistently high standard of their performance.
- As they are an autonomous performer they may benefit more from massed practice.
- Advantages and disadvantages of massed practice used in evaluative points relevant to the autonomous stage of learning. For example:
  - They can already trampoline to a high standard so massed practice will help them to overlearn the routine in preparation to repeat it in competition.
  - Massed practice will also help to further improve the trampolinist's fitness with increases in strength and power helping them get more height to perform complex moves/increases in cardiovascular power allowing them to train harder for longer.
  - If, however, the trampolinist was learning a new routine/skill or trying to correct a specific weakness, distributed practice may be more effective as it will allow them to receive feedback from their coach.
  - As trampolining is a complex and demanding skill, even an autonomous performer would struggle to use massed practice for long periods/often and would benefit from break periods to allow their body and mind to recover.

- **Trampolinist B**

- Looking at the scores in Table 1 it would appear that Trampolinist B is a cognitive/associative performer.
- This is due to the inconsistent/low standard of their performance.
- As they are a cognitive/associative performer distributed practice may be more beneficial.
- Advantages and disadvantages of distributed practice used in evaluative points relevant to the cognitive/ associative stage of learning. For example:
  - This will allow the trampolinist to focus on the routine/skills within the routine without worrying about fatigue.
  - In the gaps between routines they could receive extrinsic feedback from their coach to target key weaknesses in their performance.
  - This would help prevent the negative transfer which may arise from massed practice if they have fundamental errors in their trampolining technique.
  - However, if the training focused on a key simple aspect of the routine such as a named skill in isolation eg tuck jump, massed practice may be applicable to help the trampolinist overlearn this part of the routine.
  - Massed practice may also be beneficial if the trampolinist is failing to perform to their true ability in competitive environments as overlearning the skill will limit the impact of over arousal/social inhibition/anxiety.

Accept any other appropriate evaluation of whether massed or distributed practice would be most effective for a coach to use with:

- Trampolinist A
- Trampolinist B.

## Student responses

### Response A

Trampolinist A is an autonomous performer with a coordinated and fluent score throughout. Trampolinist B started off as a cognitive performer and has moved to an associative performer. Massed practice involves continuous training periods with no rest intervals in between. Distributed practice involves periods of training followed by periods of rest. Massed practice is more suited to autonomous performers such as Trampolinist A. It <sup>develops</sup> ~~uses~~ kinaesthesia & however which can be used for trampolinist B. One strength of massed is it overlearns the skill so the trampolinist can go over the skill and learn it. It also develops kinaesthesia of the skill, giving the performer an insight into developing intrinsic feedback and feeling correct movements. However, massed practice can lose motivation as is repeatedly practicing skills continuously on a trampoline so may become boring such as front flip on the trampoline. Massed practice also may cause chronic injury such as achilles tendonitis in trampolining as Extra space involves continuous bouncing on the ankle muscles so may cause long sustaining injuries. ~~It may be distributed~~ This type of

practice may not be suitable for trampolinist B who has entered the associate stages as may cause fatigue due to the last score of 5.1 compared to trampolinist A who's last result was 9.8. Therefore, may be useful for autonomous stages.

Distributed practice can be useful for both cognitive and associate stages as allows rest periods to reduce fatigue. This also allows time for extrinsic feedback about the skill so the coach can correct any incorrect actions or errors. It can also develop all types of skills beginners may need such as front flips and layouts in trampolining. This change between rest and training will reduce boredom for cognitive performers meaning they have higher motivation to complete the skill and carry on trampolining for longer. However, it may have slower progress compared to massed practice as is not overlearning the skill continuously. Therefore, kinesthetic may take a while to form so progress may be slow. This may also mean motivation can be lost if a performer learns an action they may develop a wrong kinesthetic feel which reduces the amount of intrinsic feedback compared to extrinsic. This may mean Trampolinist B becomes stuck in

The associative stage and may not advance to the autonomous stage. so

In conclusion massed practice is more suited to trampolinist A whilst distributed is more suited to trampolinist B.

### This is a Level 2 response

This response does a good job of exemplifying the AOs. The first half focused on the autonomous performer does a good job of linking knowledge of massed practice to trampolining (AO2) and in some case an autonomous performer (AO3). The second half, linked to distributed practice, is more a list of advantages/disadvantages with no attempt to apply/evaluate them other than using the word 'trampolinist', which is not enough to move it out of Level 2.

**6 marks**

### Response B

Massed practise is practising a skill in its entirety with no rest or recovery. Distributed practise is practise with breaks in between. Trampolinist A is in the autonomous stage of learning as the skill is clearly executed without thought as all of the scores are 9. As they are an autonomous performer, massed practise would be the most effective because it will help them to develop kinaesthesia for the trampolining routine and therefore make the performance more aesthetically pleasing. Massed practise also requires a motivated and fit performer which would be trampolinist A as they are autonomous and will have the desire to



improve technical skills and repeat the same skills over and over to do so. However, massed practise is very repetitive and can become boring. This could lead to a lack of motivation, meaning that trampolinist A's execution score will decrease over time as performance levels have decreased.

Trampolinist B is in the ~~associative~~

Extra space cognitive stage of learning as the rate of learning is slow and motor programmes are not yet developed.

Distributed practise would be most effective for this performer as a cognitive

performer needs regular breaks as they are not as fit as autonomous performers. Also, as there are regular breaks, it allows time for a coach to give feedback and help a cognitive performer improve their performance such as telling a trampolinist to stretch up more and point their toes.

However, distributed practise is not realistic to a trampolining competition situation and therefore won't help the performer to develop kinaesthesia. This may lead to the trampolining routine being jerky and not aesthetically pleasing.

**This is a Level 4 response**

The response briefly outlines knowledge of massed and distributed practice, although this is not 100% accurate. They do then manage to identify A as autonomous and B as cognitive/associative (AO3) correctly linking them to the correct practice type. There are a range of advantages and disadvantages of massed/distributed practice included which are often linked to trampolining (AO2) but less frequently linked specifically to the performer's stage of learning (AO3). This, along with no consideration of the downsides of distributed practice for a cognitive learner, limit the mark to the bottom of band 4.

**10 marks**

## Sport and society – Short answer questions

### Question 17.2 (2019)

In 1850 Dr William Penny Brookes founded the Wenlock Olympian Games.

Identify two aims of the Wenlock Olympian Games.

**[2 marks]**

### Mark scheme

#### **AO1 = 2**

- Form Olympian Class (1)
- Promote moral improvements (1)
- Promote physical improvements (1)
- Promote intellectual improvements (1)
- Targeted at people of the town and neighbourhood of Wenlock (1)

Accept first two answers only.

Accept any other appropriate aims of the Wenlock Olympian Games.

### Student responses

#### Response A

1 To introduce a high moral code.

2 Bring communities together

Response A is awarded one mark for 'introduce high moral code' (bullet point 2 on the mark scheme). However, the second point is deemed too vague, as points relating to community must be specifically linked to the town of Wenlock.

**1 mark**

### Response B

1 Develop intellectual moral and physical development.

2 Improved health amongst the lower class in particular and muscular christianity

Response B is awarded two marks for the first two answers. Although intellectual and moral development are on the same line, they are the first two responses and the only ones which can be considered. In this case they are correct, however, had they been incorrect, marks could not have been awarded for subsequent correct answers (eg physical development) as this lies beyond the first two responses.

**2 marks**

**Question 17 (2018)**

Explain two benefits of sponsorship to the companies investing large amounts of money into sport.

**[4 marks]**

**Mark scheme**

**AO1 = 2, AO2 = 2**

Award a maximum of two AO1 marks and two AO2 marks.

- Increase in publicity / media coverage (1) resulting in an increased sales/profit. (1)
- Linking the company to an elite athlete (1) adds value to a brand/creates an association with excellence/creates an association with a healthy image. (1)
- Decreases tax paid by the company (1) due to tax relief afforded on money donated as sponsorship. (1)
- Being linked to a successful sport/performer (1) can improve the morale of the company's staff. (1)
- The company is provided with tickets etc (1) which allows them to build relationships with customers and clients. (1)

Answer must include a benefit (AO1) and an explanation of the impact on the company (AO2) to be awarded 2 marks.

Accept other appropriate explanations of the benefits of sponsorship to the companies investing large amounts of money into sport.

**Student responses****Response A**

1. One benefit of sponsorship into companies is that performers can earn more money through more media coverage on adverts, so not just when playing.
2. A second benefit of sponsorship is that more role models are created to encourage participations.

Response A is awarded no marks as the answers, despite possibly being considered positives of sponsorship, are not related to the companies investing large amounts of money in sport.

**0 marks**

## Response B

1. increased media coverage of the company and it's products.
2. increase in sales. Due to sponsorship of athletes in media so role models are seen with their company.

Response B is awarded 2 marks as they have described (increased media coverage AO1) and explained (increase in sales AO2) one benefit. Had they combined both points and then repeated this for a second benefit they would have been able to access more marks.

**2 marks**

## Response C

1. It will increase their exposure <sup>and advertisement</sup>. For example, Barclays became a lot more well known because they were the sponsors of the English Premier league.
2. It improves their image as a company because they are seen to be contributing to the local community <sup>which</sup> people respond positively to.

Response C is awarded an AO1 mark for increased exposure, however, they then go on to give an example without explaining the benefits which is not creditworthy. The second point is both described (improves their image) and explained (contributing to the local community) so is awarded a further two marks.

**3 marks**



**Question 17.2 (2020)**

State one positive effect that modern-day 'amateurism' has on sport. Give an example.

[1 mark]

**Mark scheme****AO2 = 1**

- Codes of conduct still exist/fair-play/sportsmanship, eg shaking hands with opponent and umpire after match in tennis. (1)
- Amateurism viewed positively/promoted, eg fair-play awards in football/Olympic Ideal. (1)
- Opens up high level sport to all, eg amateur football teams taking on professionals in the FA Cup. (1)
- Amateur sport can be a platform to professional sport, eg through scouting of talented youths. (1)
- Less pressure on performers/more enjoyment/less deviance/cheating, eg fair play/respect encouraged in grassroots rugby. (1)

Must state a positive effect and give an example for one mark.

Accept any other appropriate positive effect that modern-day 'amateurism' has in sport with a sporting example.

**Student responses****Response A**

'Amateurism' has meant people still play sport for the love of it.  
instead of for monetary gain.

This question requires the student to both state a positive effect and give an example for one mark. Response A has failed to do this, omitting an example of where in sport people participate for the 'love of it'.

**0 marks**

**Response B**

They keep the sportsmanship traditions. Such as in  
rugby calling the ref Sir

Response B is successful in achieving the available mark as it both provides a positive effect ('keep sportsmanship traditions' bullet point 1 on the mark scheme) and provides a relevant example of calling the referee 'Sir' in rugby.

**1 mark**

### Question 16 (2019)

Sport England works closely with local partners such as the network of County Sports Partnerships.

Explain how the services provided by these partners allow Sport England to develop sport at a local level.

**[4 marks]**

### Mark scheme

**AO1 = 2, AO2 = 2**

- Club development / better clubs (AO1) allows more people to participate. (AO2)
- Coaching development / better coaches / more coaches (AO1) improves the standard of performance. (AO2)
- Education programmes (AO1) increase awareness of the importance of health and fitness. (AO2)
- Equality/targeted campaigns (AO1) working to increase participation among under-represented groups. (AO2)
- Facility development / more/better facilities(AO1) allow more people to participate. (AO2)
- Funding and support (AO1) for grassroots sports to provide the facilities/coaches/equipment to increase participation. (AO2)
- Marketing and communication (AO1) to allow local clubs to spread the word about the opportunities which are available. (AO2)
- Safeguarding (AO1) allows local clubs to provide safe environments so everyone feels comfortable taking part. (AO2)
- Strategic network (AO1) working with other organisations to increase participation. (AO2)
- Volunteer development (AO1) provide more volunteer coaches/officials so clubs can effectively cater for more participants. (AO2)

AO1 must be present to award the AO2 marks.

Accept any other appropriate explanation of how the services provided by local partners allow Sport England to develop sport at a local level.

## Student responses

### Response A

Because Sport England can't see every Counties levels of sport, so they work with County sports partnership so they can monitor sports level and if there is a decrease in participation of sports in one county partnership can help and For example more leseure centres, Football pitches.

To achieve the marks on this question students were required to state a service provided by local partners (AO1) and explain how it developed sport at a local level (AO2). Response A only accesses one mark for highlighting that local partners are responsible for facility provision (bullet point 5 on the mark scheme). Had they gone on to explain that more facilities allowed more people to participate this would have secured them an additional AO2 mark.

**1 mark**

### Response B

Local partners often provide facilities and equipment or advertisement which helps to develop sport at a local level as it spreads awareness and provides a community feel. This encourages more people to get involved.

Response B is awarded both AO1 marks for highlighting that local partners 'provide facilities' (bullet point 5 on the mark scheme) and are responsible for 'advertisement' (bullet point 7 on the mark scheme). They then go on to be awarded one AO2 mark for their explanation that advertisement 'spreads awareness'. They are not awarded a second AO2 mark for 'encourages more people to get involved' as this is not directly linked to a service, thus is deemed too vague.

**3 marks**

### Question 16 (2018)

State two social benefits to an individual of increasing their participation in physical activity and/or sport.

[2 marks]

### Mark scheme

**AO1 = 2**

Accept first two answers only. Award one mark for each of the following:

- Happier/more positive outlook on life makes you more approachable to others (1)
- Improved confidence/self-esteem in the company of others (1)
- Improved communication skills/ability to work with others (1)
- Meet new people/form friendships with people with similar interests (1)

Answers must be specifically linked to social benefits.

Accept other appropriate social benefits of increased participation in physical activity and/or sport to an individual.

### Student responses

#### Response A

1. Decreasing pressure on the NHS as the population are healthier and at less risk of illness or disease.
2. Reduced crime statistics as free time is spent on positive past time rather than delinquency or crime.

This question is specifically assessing students' knowledge of social benefits to the individual. Response A is not awarded any marks as both of their points are benefits related to society as a whole.

**0 marks**

Response B

1. ~~Reduce~~ ~~anxiety~~ & Make new friends
2. Meet new people

Response B correctly identifies that one social benefit to an individual is that they will 'make new friends' (bullet point 4 on the mark scheme). However, their second point is then a repeat of this same marking point so cannot be credited again.

**1 mark**

Response C

1. Improve confidence and self-esteem
- 
2. Meet new people and make friends.

As confidence and self-esteem are on the same line of the mark scheme, and are included in this response as one point, they are deemed creditworthy against bullet point 2 of the mark scheme and not considered a repeat. This allows the second response, 'meet new people,' to also be considered and marked correct, awarding the candidate both marks.

**2 marks**

## Sport and society – Extended response questions

### Question 18 (2019)

Social stratification can impact on the sports participation of an individual. One example of social stratification may be the class that an individual belongs to.

Evaluate the different sporting experiences that upper class and working class 15-year-olds may have and how this might impact on their life-long participation in sport.

**[8 marks]**

### Mark scheme

**AO1 = 2, AO2 = 3, AO3 = 3**

Students are expected to answer in continuous prose, use good English, organise information clearly and use specialist vocabulary where appropriate.

#### Level 4

7-8 marks

- Knowledge is consistently accurate and well detailed.
- Application of breadth or depth of knowledge is clearly evident.
- Analysis and/or evaluation is coherently and consistently made between different relevant factors and their impact.
- Relevant terminology is consistently used.
- The answer almost always demonstrated substantiated reasoning, clarity, structure and focus.

#### Level 3

5-6 marks

- Knowledge is usually accurate and detailed.
- Application of breadth or depth of knowledge is often evident.
- Analysis and/or evaluation is often made between different relevant factors and their impact, and is usually coherent.
- Relevant terminology is often used.
- The answer usually demonstrates substantiated reasoning, clarity, structure and focus.

#### Level 2

3-4 marks

- Knowledge is sometimes accurate with some details.
- Application of breadth or depth of knowledge is sometimes evident.
- Analysis and/or evaluation is sometimes made between different relevant factors and their impact, but may lack coherence.
- Relevant terminology is sometimes used.
- The answer occasionally demonstrated substantiated reasoning, but may lack clarity, structure and focus.



**Level 1**

1-2 marks

- Knowledge may be limited.
- Application of breadth or depth of knowledge may be limited or not evident.
- There may be little or no analysis and/or evaluation between different relevant factors and their impact.
- Relevant terminology is occasionally used.
- The answer may lack substantiated reasoning, clarity, structure and focus.

0 mark

No relevant content.

**Possible content may include:**

**AO1** Knowledge of social stratification and social class

- Social stratification is a type of social inequality where society is divided into different levels based on a social characteristic
- Social class is a term used to define social inequalities eg certain groups have more access to wealth, income and power than others.
- Factors which contribute to social class include a person's job, family, background, education and income

**AO2** Application of social class to experiences in sport (variety and amount)

- An upper class 15 year is likely to have greater access to a wide range of sports
- This is because they will be able to afford equipment, membership fees etc which are required to participate
- It may be suggested that they will also be better educated having access to facilities at school but also having a greater understanding of the importance of being physically active
- However, there may be greater pressure from parents/school for upper class students to perform well in education which may limit the time they have available for sport
- A working class 15-year-old may not have access to as many sports as they may not be able to afford equipment, membership fees etc. which are required to participate
- Their main provider of sporting experiences is likely to be there school
- They may have less time to participate if they have a part time job
- It may be however that the working-class child plays more sport than the upper-class child
- This could be because they have more time due to lower expectations to perform well in education
- They may see sport as a means of social mobility and a way to change their social class

**AO3** Evaluation of impact on life-long participation

- As upper-class children will be able to try more sports it increases the chances of them finding one they enjoy
- Understanding the importance of physical activity for health and wellbeing also means they are more likely to make time to take part in sport
- May be less likely to enjoy life-long participation
- Due to pressure of job/responsibilities/lack of motivation

## A-LEVEL PHYSICAL EDUCATION – 7582/1 - ANSWERS AND COMMENTARIES

- (A working class 15-year-old may not have access to as many sports as they may not be able to afford equipment, membership fees etc. which are required to participate.) This may limit the likelihood of them participating throughout their life as they may have negative experiences
- Only playing sports they don't enjoy or playing in substandard facilities or with substandard equipment
- May be more likely to enjoy life-long participation
- Due to it providing income/additional income/escapism
- Social class not fixed so may move classes during lifetime, impacting participation

Credit other relevant evaluation of the different sporting experiences that an upper class and working class 15-year-old may have and how this might impact on their life-long participation in sport.

### Student responses

#### Response A

Upper class is a class of which was more financially stable. They ~~worked~~ <sup>had a better</sup> living than the lower class as they had more wealth. The lower class was the poor people living in small villages with little resources.

An upper class 15 year old had probably taken part in a game of football with an actual football and in a pitch. The upper class is more highly professional at playing football in the correct manner and having played in ~~for~~ within correct rules.

A lower class 15 year old was not provided with any equipment. They would make the equipment out of their own resources. The 15 year old child played in probably on more aggressive gaming field.

This means that the upper class child will have a game of football with an actual football and in a pitch. The upper class is more highly professional at playing football in the correct manner and having played in ~~for~~ within correct rules.

A lower class 15 year old was not provided with any equipment. They would make the equipment out of their own resources. The 15 year old child played more knowledge and better experience at a game than a lower class. Will the upper class child will reach to a higher profession at a shorter amount of time compared to a lower class.

**This is a Level 1 response**

Response A demonstrates some knowledge of the differences between social classes which exist within society. There is some limited application to their sporting experiences, however much of this is inaccurate. There is no evidence of any analysis of how social stratification will impact on their lifelong participation (AO3).

**2 marks**

**Response B**

Social stratification is the divide in social classes in society for example their wealth, class and status. Often this can impact on ones sports participation, factors that effect sport participation is money, role models, myths and confidence. Upper class 15-year-olds now might be able to experience more expensive sports and more of a variety of sports, for example an upper class 15-year-old might have the opportunity to horse ride as the facilities are expensive, and so is the sport in its self. a upper class 15-year-old might be able to associate with this sport because they have wealth. Additionally they may be able to have lessons which are expensive meaning they are more likely to stay involved longer in that sport than that of someone who doesn't have



That opportunity. A working class 13-year old might not have the funding ~~to~~ to participate in sport for a lifelong process- and ~~they~~ if they did not have the financial backing they would not be able to participate in expensive sporting activities such as horse riding, instead they could join free clubs and sports that do not involve any equipment such as running - if they are not discriminated against due to their financial or class status then there is no reason for them to not partake in sport as long as a 13-year old from an upper class side. They just might not be exposed to as many sporting opportunities.

### This is a Level 3 response

Response B demonstrates good knowledge of the difference between the upper and working class. They then apply this knowledge to a limited number of examples, highlighting some of the positives being from the upper class would have on lifelong participation. For the working class 15-year-old some negative impacts of their finances on lifelong participation are provided, with the counter argument that in certain sports this need not be a limiting factor (AO3).

**5 marks**

## Response C

Social stratification is a type of social inequality where society is ~~divided~~ divided into different layers based on a social characteristic such as wealth or status. This can impact positively or negatively on an individual's overall life chances. For example, the type of school you go to will impact the amount of time devoted to sport, quality of coaching and quality of facilities.

~~An 15 year old~~

A working class 15-year-old may have poorer health than an upper class 15-year-old and this will undermine their physical abilities, in regards to sport. They may also have less money to spend on equipment, sporting kit and specialist ~~clothing~~ coaching. Schools themselves may magnify the difference in class as schools in more affluent areas have better sports facilities. A working class 15-year-old may have <sup>more</sup> domestic responsibilities and may not be able to ~~participate~~ join clubs.

This could impact life-long participation as the working class may have had a bad experience and will not want to carry on after they finish school. They may feel excluded and feel as though they are not worthy to participate. However, they might want to participate later on life because they **AO3** never had the chance to during school and they may have more time and money. Participating in sport can also



allow them to develop a new athletic identity and success could be based on equality of opportunity. However, the very nature of sport is competitive and people's social class does affect their involvement in sport. The upper class may not want to participate in sport later because they may have gotten bored of it and want to try different things. However, they may carry on as it has become a part of their lifestyle.

#### This is a Level 4 response

Response C is awarded full marks as it demonstrates excellent knowledge which is consistently applied to the sporting experiences each 15-year-old will have. The main differentiating factor between this response and Response B is that here we can see both sides of the argument for each child. These evaluative points are made within a response which always demonstrates substantiated reasoning, clarity, structure, and focus.

**8 marks**

### Question 20 (2022)

The number of factories increased in the UK during the industrial and post-industrial period (1780–1900).

Evaluate the impact of this development on the physical activity of the working class:

- at the start of the 19th century
- at the end of the 19th century.

**[8 marks]**

### Mark scheme

**AO1 = 2, AO2 = 3, AO3 = 3**

Students are expected to answer in continuous prose, use good English, organise information clearly and use specialist vocabulary where appropriate.

#### Level 4

7-8 marks

- Knowledge is consistently accurate and well detailed.
- Application of breadth or depth of knowledge is clearly evident.
- Analysis and/or evaluation is coherently and consistently made between different relevant factors and their impact.
- Relevant terminology is consistently used.
- The answer almost always demonstrated substantiated reasoning, clarity, structure and focus.

#### Level 3

5-6 marks

- Knowledge is usually accurate and detailed.
- Application of breadth or depth of knowledge is often evident.
- Analysis and/or evaluation is often made between different relevant factors and their impact, and is usually coherent.
- Relevant terminology is often used.
- The answer usually demonstrates substantiated reasoning, clarity, structure and focus.

#### Level 2

3-4 marks

- Knowledge is sometimes accurate with some details.
- Application of breadth or depth of knowledge is sometimes evident.
- Analysis and/or evaluation is sometimes made between different relevant factors and their impact, but may lack coherence.
- Relevant terminology is sometimes used.
- The answer occasionally demonstrated substantiated reasoning, but may lack clarity, structure and focus.

### Level 1

1-2 marks

- Knowledge may be limited. Application of breadth or depth of knowledge
- may be limited or not evident.
- There may be little or no analysis and/or evaluation between different relevant factors and their impact.
- Relevant terminology is occasionally used.
- The answer may lack substantiated reasoning, clarity, structure and focus.

0 mark

No relevant content.

### Possible content may include:

**AO1** Knowledge of the development of factories between 1780 and 1900.

- New factories required large number of employees to work in them.
- Working class lowest group in new three tier class system.
- Urbanisation occurred.
- New laws/rules/working patterns required to manage workforce/population.

**AO2** Application to the working class.

- Urbanisation occurred as the lower/peasant class moved from countryside to cities to take up new jobs in factories and became the working class.
- Initially wages were low meaning the working class suffered in poverty/these gradually improved.
- Working hours were long initially/this changed as half days were introduced on Saturdays.
- The working class suffered from poor health due to living and working conditions in newly crowded cities/this improved as factory owners realised it was in their interest to look after their workforce/new laws were introduced.
- The working class also had their rights curtailed with several new laws introduced to manage behaviour in the crowded cities/workers rights were introduced in the late 19th century which improved standards for the working class.

**AO3** Evaluation of what impact the developments in factories between 1780–1900 had on the physical activity of the working class at the beginning and end of this period.

- At the start of the 19th century the development of factories had a negative impact on the physical activity of the working class because:
  - poor health meant that the working class were not well/fit enough to take part in physical activity
  - long working hours meant the working class lacked the free time to take part in physical activity
  - low wages meant the working class lacked the disposable income to pay to take part/for equipment to take part in physical activity
  - lack of public provision of facilities/space in new towns so the working class had nowhere to be physically active.
- By the end of the 19th century the development of factories had a positive impact on the physical activity of the working class because:

## A-LEVEL PHYSICAL EDUCATION – 7582/1 - ANSWERS AND COMMENTARIES

- factory owners started to take an interest in the health and wellbeing of their workforce which meant they were healthy enough to take part and encouraged to do so
- to improve the health of their workers factory owners created teams/competitions to promote physical activity
- they also gave their workforce time off to be active at weekends with broken time payments available to some
- factory owners became the new middle class and valued athleticism highly, becoming patrons for working class sport
- they provided the facilities for the working class to be physically active.

Accept any other appropriate evaluation of the impact of this development on the physical activity of the working class:

- at the start of the 19th century
- at the end of the 19th century.

### Student responses

#### Response A

At the start of the 19th century there was an initial decrease in working class sport. This was because of urbanisation where everyone moved from the country side to towns and cities. This meant there was a lack of space and with everyone being crowded together, there was very poor hygiene so disease spread fast.

Games like mob football got banned for its violent nature and due to all the working class now working in factories, they didn't have as much time as they worked long hours.

By the end of the 19th century,

it started to improve as factory owners formed their own teams of workers and adapted their work hours to fit in. There was better transport with the development of the steam train so people could travel to watch and to play sports cheaply. There was also an improvement in communications so news of football scores could be shown to everyone.

### This is a Level 2 response

This is a good answer which is awarded a Level 3 mark of 5. It demonstrates good breadth with multiple points made, and both time periods considered. When compared to other scripts it becomes evident how much more breadth and depth is required by the top band, hence why this does not make it.

**5 marks**

### Response B

In the early 19th century the increasing number of factories in UK lead to mass ~~move~~ internal migration of people from the country side to the cities in search of work and jobs. This is known as urbanisation.

Due to the mass movement there were large numbers of people in increasingly small spaces in poor conditions. The living conditions were very poor with several families living in tiny houses with poor ventilation. This combined with the

poor Sanitation meant public health was very poor. The cholera epidemic at the start of the 19<sup>th</sup> century also meant that many people died during this period and public health was very poor. this meant there was little physical activity happening.

the long working hours and days of the working class meant there was little time towards playing physical activity and any spare time people would be too tired.

Due to the urban area there was also a distinct lack of space for sport to be played making it difficult and overall decreasing the amount of physical activity done.

Towards the end of the 19<sup>th</sup> century there was an increase in the amount of physical activity done.

General health improved as government pass health bills which provided bathhouses for sanitation and public parks which were open spaces. The factory owners also provided these facilities as they believed that healthier happier workers would be more productive. Increasing the health of the population allowed for more physical activity to take place.

There was also an increase in purpose built



facilities for sports such as football. philanthropists, churches, factories and government provided purpose built facilities which increased the amount of physical activity.

There was also the development of church and factory teams such as West Ham and Arsenal. This endorsement of football by the church and ~~the~~ broken-time payments given to factory workers to train for their factory team increased the amount of physical activity towards the end of the 19th century.

#### This is a Level 4 response

This is a good example of a full mark response for reference. It shows the breadth required to make the top band. It is also successful in fully developing the majority of points made as they are applied to the working class (AO2) and include an impact on their performance in sport across the different time periods (AO3).

**8 marks**

## Question 20 (2020)

Analyse how the changes in society between 1780 and 1900, driven by the Industrial Revolution, improved the sporting opportunities available to the working classes in Great Britain.

**[15 marks]**

## Mark scheme

**AO1 = 4, AO2 = 5, AO3 = 6**

Students are expected to answer in continuous prose, use good English, organise information clearly and use specialist vocabulary where appropriate.

### Level 5

13-15 marks

- Knowledge is consistently comprehensive, accurate and well detailed.
- Application of breadth or depth of knowledge is clearly evident.
- Analysis and/or evaluation is coherently and consistently made between different relevant factors and their impact.
- Relevant terminology is almost always used.
- The answer demonstrated an high level of sustained reasoning, clarity and focus.

### Level 4

10-12 marks

- Knowledge is usually comprehensive, accurate and detailed.
- Application of breadth or depth of knowledge is often evident.
- Analysis and/or evaluation is often made between different relevant factors and their impact, and is usually coherent.
- Relevant terminology is usually used.
- The answer usually demonstrates substantiated reasoning, clarity, structure and focus.

### Level 3

7-9 marks

- Knowledge is generally accurate and sometimes detailed.
- Application of breadth or depth of knowledge is sometimes evident.
- Some analysis and/or evaluation is made between different relevant factors and their impact but may sometimes lack coherence.
- Relevant terminology is used but may sometimes be missing.
- The answer sometimes demonstrated substantiated reasoning, clarity, structure and focus.

## Level 2

4-6 marks

- Knowledge is sometimes accurate but may lack detail.
- Application of breadth or depth of knowledge is occasionally evident.
- Some analysis and/or evaluation is attempted between different relevant factors and their impact, but is likely to lack coherence.
- Relevant terminology is occasionally used.
- The answer occasionally demonstrated substantiated reasoning, but may lack clarity, structure and/or focus at times.

## Level 1

1-3 marks

- Knowledge is limited and may lack accuracy and detail.
- Application of
- breadth or depth of knowledge is likely to be limited or not evident.
- There may be very little or no analysis and/or evaluation made between different relevant factors and their impact.
- Relevant terminology used only very occasionally.
- The answer often lacks substantiated reasoning, clarity, structure and/or focus.

0 mark

No relevant content.

## Possible content may include:

- **AO1** Knowledge of changes in society
- Urbanisation.
- Improvements in transport and communication.
- Provision through factories, churches and local authorities.
- Public schools/universities.
- Development of three-tier class system (emphasis on middle class and working class).
- Development of national governing bodies.
- Consideration of the changing role of women in sport.
- The status of amateur and professional performers.
- **AO2** Application of the changes in society on lifestyle of working-class people
- People moved from the countryside to towns (urbanisation) looking for work.
- More people in a smaller area meant less space.
- Jobs in factories were poorly paid and required people to work long hours; loss of rights/increased law and order; poor working conditions, eg dangerous poor living conditions, eg pollution leading to disease.
- Factory owners wanted a healthier more productive workforce so improved conditions and shortened the working week.
- The emergence of the middle class came about as people took advantage of new business opportunities.
- Development of rail transport and roads made travel cheaper and more accessible.
- Communications developed, eg postal system, printing press.
- Church involvement and support for recreations eg muscular Christianity.

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- Era of social reform, eg education acts/role of ex-public schoolboys as politicians.
- **AO3** Analysing the impact of these changes on recreation of working class of Great Britain
- As time moved on rational recreation developed, led by middle class, factory owners and church.
- Factories had teams which would play on a Saturday as the working week was shortened.
- Improved transport allowed fixtures to be played across larger areas.
- Church offered use of halls and land/set up Sunday school teams/ex-public schoolboys influential as clergymen/spread of muscular Christianity/YMCA/boys brigade.
- Social reforms led to paid holiday, better working conditions, public parks, which all enabled more working-class opportunities to play football.
- Formation of FA led to more fixtures and competitions to play in/quickly accepted professionalism leading to rise in standard and status of working-class footballers.
- Working-class participation in cross-country/harrier clubs.
- Accept any other analysis of how the changes in society between 1780 and 1900, driven by the industrial revolution, improved the sporting opportunities available to the working classes in Great Britain.

### Student responses

#### Response A

in the industrial ~~soet~~ revolution, opportunities became more available to working-classes via more free time provided by factory-owners, ~~the~~ The improvement of steam trains and railways allowed the working-class to travel home and away.

#### This is a Level 1 response

The starting point for an answer that contains any relevant content, however little, is one mark. For that reason, this answer is awarded two marks as it moves beyond this by demonstrating a basic knowledge of the period in question, via a few key points.

**2 marks**

## Response B

The industrial revolution was the change in society between 1780 and 1900 that resulted in improvements such as transport, well-being, hygiene, and literacy.

The improvements to transport enabled all classes to travel to different towns and villages to participate in sport. This provided increased opportunities for the working class to participate as travel was inexpensive. It also enabled the increase in spectators.

There was also an improvement in hygiene and well-being within the working class which in turn also improved their health and fitness, increasing their abilities to participate in ~~recreate~~ sporting events.

Specific holidays were created so that the working class could leave their jobs e.g. half days on Saturdays, in order to participate in activities such as association football.

The church also enabled working class athletes to have an increased amount of sporting ~~opport~~ opportunities as they provided rules and codification of the sport, increasing literacy of the working class. The church also allowed the working class to use the church grounds to play sport so that they had more local sporting opportunities.



**This is a Level 2 response**

Response B demonstrates a good breadth of knowledge highlighting a number of ways that society changed between 1780 and 1900. In some cases, the impact of these changes on the working class is explained, although this frequently lacks depth. The analysis of how these changes impacted sports participation by the working class is evident but limited, with very few links made to the sports on the specification (association football, athletics, and tennis).

**6 marks**

**Response C**

One of the main changes in society between 1780 and 1900 was urbanisation which was where people moved ~~from~~ <sup>to</sup> towns and cities from the rural countryside.

This eliminated the sport of mob football as there was now no room to play it, this meant that new sports were created such as football as we see it today.

However negative changes also came from urbanisation such as increased health risks such as pollution from factories which caused health implications which could have stopped people playing sports.

Society also changed as it was more civilised which meant that sports now had rules as they had undergone codification. Codification was usually implemented by newly founded National governing bodies (NGB's).

This made sport safer and more organised meaning



This made Sport Safer and More organised meaning that introduction of leagues increased the amount of opportunities for people to get involved with sports like football and Lawn tennis.

However Codification meant that some areas played with different rules to other areas meaning that they could not play against one another. ~~from~~ This then limited the opportunities some people had.

In 1900 there were ~~for~~ better transport links compared to 1780 because a national network

of railways was now implemented. And was not expensive.

This meant that working class people could travel

Extra space to support a sports team in a league or play.

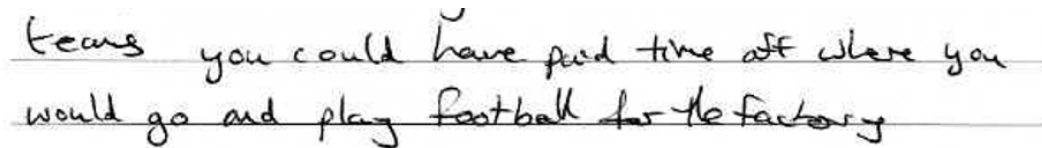
This then increased the popularity of football ~~as~~ creating more opportunities for the working class to play and enjoy sport.

However transport still was not affordable to the most poor which excluded them from taking part away from where they lived.

By 1900 everything was majorly industrialized meaning that many people working in towns and cities worked in factories.

This could limit the amount of sporting opportunities they had as they would have to work long hours 6 days a week leaving them ~~and~~ day where they had free time.

However some factories did have sports teams like football and if you were on one of those



leaving you could have paid time off where you would go and play football for the factory

**This is a Level 4 response**

Response C accesses Level 4 as their work demonstrates a breadth of knowledge specifically related to the question. There are a range of changes highlighted, each of which is explained in relation to its impact on the working class. There is no requirement in this 'analyse' question to give both sides of the argument but by doing so the candidate shows the depth of their understanding. Response C is written coherently, linking different factors together, and analyses the impact of changes on sporting opportunities which moves it up into the higher levels. A greater focus on the specific sports highlighted in the specification would have elevated this answer further.

**11 marks**

## Question 21 (2022)

Active Partnerships, formerly County Sports Partnerships, are an example of a local partner of Sport England. Sport England's local partners work to overcome the barriers to participation that some groups may face.

Analyse how the work of Sport England's local partners can overcome the barriers to participation for those disadvantaged by their socio-economic status.

**[15 marks]**

## Mark scheme

**AO1 = 4, AO2 = 5, AO3 = 6**

Students are expected to answer in continuous prose, use good English, organise information clearly and use specialist vocabulary where appropriate.

### Level 5

13–15 marks

- Knowledge is consistently comprehensive, accurate and well detailed.
- Application of breadth or depth of knowledge is clearly evident.
- Analysis and/or evaluation is coherently and consistently made between different relevant factors and their impact.
- Relevant terminology is almost always used.
- The answer demonstrates a high level of substantiated reasoning, clarity, structure and focus.

### Level 4

10–12 marks

- Knowledge is usually comprehensive, accurate and detailed.
- Application of breadth or depth of knowledge is often evident.
- Analysis and/or evaluation is often made between different relevant factors and their impact, and is usually coherent.
- Relevant terminology is usually used.
- The answer usually demonstrates substantiated reasoning, clarity, structure and focus.

### Level 3

7–9 marks

- Knowledge is generally accurate and sometimes detailed.
- Application of breadth or depth of knowledge is sometimes evident.
- Some analysis and/or evaluation is made between different relevant factors and their impact but may sometimes lack coherence.
- Relevant terminology is used but may sometimes be missing.
- The answer sometimes demonstrates substantiated reasoning, clarity, structure and focus.

### Level 2

4–6 marks

- Knowledge is sometimes accurate but may lack detail.
- Application of breadth or depth of knowledge is occasionally evident.

## A-LEVEL PHYSICAL EDUCATION – 7582/1 - ANSWERS AND COMMENTARIES

- Some analysis and/or evaluation is attempted between different relevant factors and their impact, but is likely to lack coherence.
- Relevant terminology is occasionally used.
- The answer occasionally demonstrates substantiated reasoning, but may lack clarity, structure and/or focus at times.

### Level 1

1–3 marks

- Knowledge is limited and may lack accuracy and detail.
- Application of breadth or depth of knowledge is likely to be limited or not evident.
- There may be very little or no analysis and/or evaluation made between different relevant factors and their impact.
- Relevant terminology used only very occasionally.
- The answer often lacks substantiated reasoning, clarity, structure and/or focus.

0

No relevant content.

### Possible content may include:

**AO1** Knowledge of the work of Sport England's local partners and the barriers to participation faced by those disadvantaged by their socio-economic status

- **Work of local partners**
  - Club development.
  - Coaching/workforce/volunteer development.
  - Education programmes/raising awareness.
  - Equality/targeted campaigns.
  - Facility development.
  - Funding and support.
  - Marketing and communication.
  - Safeguarding.
  - Strategic networking.
- **Barriers to participation faced by those disadvantaged by their socio-economic status**
  - Lack of disposable income.
  - Limited free time.
  - Access to facilities/open spaces/countryside.
  - Possible lower focus on the importance of education.
  - Lack of role models in some sports/positions of authority.
  - Lack of transport.
  - Discrimination/stereotyping.

**AO2** Application of the work of Sport England's local partners to overcome the barriers to participation faced by those disadvantaged by their socio-economic status

- Lack of disposable income can be overcome by funding and support/education programmes/targeted campaigns.
- Limited free time can be overcome by safeguarding/marketing and communication.

## A-LEVEL PHYSICAL EDUCATION – 7582/1 - ANSWERS AND COMMENTARIES

- Access to facilities can be overcome by club development/facility development/education programmes/targeted campaigns/funding and support.
- Poor education can be overcome by volunteer development/education programmes/raising awareness/targeted campaigns.
- Lack of role models in some sports/positions of authority can be overcome by coaching/workforce /volunteer development/education programmes/raising awareness/equality/targeted campaigns
- Lack of transport by club development/facility development.
- Discrimination/stereotyping can be overcome by education programmes/targeted campaigns.

**AO3** Analysis of how the work of Sport England's local partners can overcome the barriers to participation for those disadvantaged by their socio-economic status

- Funding can be provided to local facilities which allows them to reduce the cost of activities for those from lower socio-economic groups/disadvantaged backgrounds.
- Targeted campaigns eg School Games could also be used to highlight low-cost exercise options such as jogging/provide structured competition for all socio-economic groups at no cost.
- Increased education may help people to use time efficient opportunities to be active such as online HIIT workouts, although access to tech/internet may be an issue for this group.
- New facilities can be developed in key areas where lower socio-economic groups/people from disadvantaged backgrounds live. This will give them greater access to a wider range of sports.
- Local clubs/satellite clubs could be set up with local coaches developed so that the existing facilities available in areas where lower socio-economic groups/people from disadvantaged backgrounds live can provide high quality experiences.
- By running targeted campaigns in the local area high impact role models, such as successful athletes from the local area, can be used to highlight the benefits of physical activity and exercise.
- As organisations are local they can focus in on the key issues which exist in their communities and raise participation in sport to address key social issues.

Accept any other appropriate analysis of how the work of Sport England's local partners can overcome the barriers to participation for those disadvantaged by their socio-economic status.

## Student responses

## Response A

Sport England's aim is to increase mass participation and develop sporting habits for life. They work with county sport partnerships<sup>(CSP)</sup> as they CSP's can

use the funding and implement into areas where it's needed. This is because CSP's know what facilities need funding and which ones will get the most participation.

Sport England receives money from the national lottery and from the government, this is then given to CSP's and national partners.

Barriers such as the costs to participate in clubs and use facilities may be too expensive for some people. This is why CSP's ~~will~~ could introduce free ~~sports zones~~ classes to people who have a low socio-economic

Extra space status. Street games is a charity which works with CSP's to subsidise funding ~~for~~<sup>so</sup> people can participate.



A barrier could be no specialist facilities for sport in their area. So to combat this <sup>their local</sup> CSP's

could build <sup>facilities for them</sup> a basketball to use for free such as an outdoor basketball court, this would allow people to continue participate in sport ~~despite~~ even if they don't have the money to do so.

Some people may not be able to travel to places to compete in sport, so free transport ~~to~~ could be provided to allow them to participate in sport.

A barrier to participate could be people are unable to afford to participate, so this is why CSP's will work with schools to get people participating. This is seen through Sport England funding sport games which gets kids participating.

### This is a Level 2 response

The response shows some knowledge of local partners, which is then applied to the working class. They develop some points with specific examples but depth is lacking limiting the mark to the top of Level 2.

**6 marks**

## Response B

Sport England ~~are~~ have a 10 year plan named 'unleashing the movement' which aim to strategically distribute money in order to increase participation rates.

One barrier faced by people of a low socio economic group is lack of disposable income. People of a low socio economic group often cannot afford equipment or travel to their local sports clubs. Therefore ~~a local~~ ~~part~~ local partners of sport England such as street games aim to increase participation through 'doorstep sports' this is where money is given via sport England to street games to be able to bring sports to local disadvantaged areas. Therefore, people do not have to pay for transport or equipment as it is all brought to them. This increases participation, ~~at~~ however, only if the disadvantaged areas are made aware. ~~therefore~~

Extra space

Another barrier faced by low socio economic groups is lack of time due to having to work multiple jobs or shifts. However, ~~local partners~~ ~~such as the coaching~~ One way this barrier can be overcome is to increase the length of time sports

TURN OVER

facilities in the local area are open for. Sport England therefore, give money to local clubs or schools to be able to fund the opening of their facilities for longer. This means participation rates for disadvantaged will increase as they will ~~be~~ have ~~at~~ ~~longer~~ more opportunity to go to clubs after work.

Another barrier faced is lack of awareness. ~~People~~ ~~at~~ People of low socioeconomic groups often do not have the knowledge or awareness on what is available in the local area. Therefore, ~~at~~ local partners such as UK Coaching gain money off Sport England to be able to be trained to educated people of a low socio economic background what is available. This may be by going into schools and informing children by doing 'taster sessions'. This would increase participation in sports as people from a disadvantaged ~~at~~ background will have more knowledge on what's available so may go and join the local club of which they had a taster session in school.

**This is a Level 4 response**

This is a good example for reference as they are able to demonstrate both the breadth and depth of knowledge required by a higher mark answer. The response fully develops 3 different points linking the work of local partners to the participation of those from lower socio-economic groups, adding specific examples. Had the student continued this for another one or two points they would have progressed up towards the top band and full marks.

**10 marks**

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